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ABSTRACT

The current situation in the field of health sciences in California is assessed and recommendations concerning modification of policies of courses of action are made. The first five chapters cover the health fields of medical, nursing, dental, pharmaceutical, and optometric education. Each chapter explores the adequacy of program size, educational opportunity in the particular specialty, special considerations in planning for the specialty, evaluative findings, utilization of clinical training sites, mid-level or auxiliary personnel, and recommendations made by the California Postsecondary Education Commission. A brief bibliography is included at the end of each chapter. The sixth chapter explores the standing of underrepresented groups (women and certain ethnic minorities) in the health professions, and current efforts to provide equal educational opportunity for these groups. The final chapter reviews the state of the art in health sciences education planning. The Commission's Resolution 6-79, "Approving a Health Sciences Education Plan for California: 1978-1980," and the text of applicable state legislation are included in the report. (PHR)

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A HEALTH SCIENCES EDUCATION PLAN FOR CALIFORNIA: 1978 - 1980

THE FIRST IN A SERIES OF BIENNIAL PLANS

HE 011 695

july 1979

California Postsecondary
Education Commission

Resolution 6-79

Approving
A Health Sciences Education Plan for California: 1978-1980

WHEREAS, Section 22712.5 of the Education Code directs the California Postsecondary Education Commission to issue a biennial Health Sciences Education Plan, and

WHEREAS, In developing its Plan, the Commission is to take into account the Health Manpower Plan issued by the Office of Statewide Health Planning and Development, successor to the manpower planning responsibilities of the former Department of Health, and

WHEREAS, The Commission has considered the findings and recommendations contained in the Health Manpower Plan, and

WHEREAS, The Commission has collected extensive data on enrollments and outputs of educational programs in California in medicine, nursing, dentistry, pharmacy, and optometry, including, whenever possible, information on the sex and ethnicity of the students in these programs, and

WHEREAS, The Commission has consulted widely with educators, professional practitioners, licensing boards, and other interested parties in each of the five health science education fields, and

WHEREAS, The Policy Development Committee of the Commission has met frequently to review and discuss each chapter of the Plan, together with a series of recommendations based on Commission staff's findings, and

WHEREAS, The Policy Development Committee has approved, A Health Sciences Education Plan for California: 1978-1980, in its final form, including recommendations, and transmitted the Plan to the full Commission for its consideration and action; now, therefore, be it

RESOLVED, That the California Postsecondary Education Commission approve, A Health Sciences Education Plan for California: 1978-1980, including recommendations, and transmit the Plan to the Legislature, the Governor, and appropriate health and educational organizations.

Adopted
July 9, 1979

TABLE OF CONTENTS

Page

Introduction . . . i
  Summary of Recommendations . . . iii
  Text of AB 1748 . . . vi

Chapter I, Medical Education . . . 1
  Adequacy of Program Size . . . 2
  Mid-Level Practitioners . . . 14
  Educational Opportunity . . . 18
  Special Considerations in Planning for Medical Education . . . 32
  Findings . . . 33
  Utilization of Clinical Training Sites . . . 40
  Recommendations . . . 40
  Bibliography . . . 75

Chapter II, Nursing Education . . . 76
  Adequacy of Program Size . . . 77
  Mid-Level Practitioners: The L.V.N. . . . 88
  Articulation . . . 90
  Educational Opportunity . . . 93
  California's Nursing Work Force . . . 94
  Special Considerations . . . 113
  Findings . . . 118
  Utilization of Clinical Sites . . . 119
  Recommendations . . . 120
  Bibliography . . . 121

Chapter III, Dental Education . . . 123
  Adequacy of Program Size . . . 123
  Dental Auxiliaries . . . 124
  Educational Opportunity . . . 127
  Special Considerations . . . 129
  Findings . . . 129
  Utilization of Clinical Sites . . . 130
  Recommendations . . . 130
  Bibliography . . . 131

Chapter IV, Pharmaceutical Education . . . 132
  Adequacy of the Educational Program . . . 134
  Auxiliary Personnel . . . 135
  Educational Opportunity . . . 137
  Special Considerations . . . 139
  Findings . . . 140
  Clinical Utilization . . . 140
  Recommendations . . . 141
  Bibliography . . . 142

TABLE OF CONTENTS (Continued)

Page

Chapter V, Optometric Education 143

Adequacy of Program 144
Mid-Level Practitioners 146
Educational Opportunity 147
Special Considerations 148
Findings 150
Adequacy of Clinical Sites 150
Recommendations 150
Bibliography 151

Chapter VI, Equal Educational Opportunity 152

Medicine 153
Nursing 159
Dentistry 167
Pharmacy 172
Optometry 175
Programs to Improve Educational Opportunity in the Health Sciences 178
Recommendations 183

Chapter VII, Health Sciences Education: Some Concluding Perspectives 185

INTRODUCTION

The *Health Sciences Education Plan* has been developed by the Commission pursuant to Assembly Bill No. 1748 (Duffy, 1976). Introduced by Assemblyman Gordon Duffy, the bill calls for the Commission to develop such a plan, taking into account the *Health Manpower Plan* prepared by the State Department of Health, also mandated by the same legislation. (The text of AB 1748 appears at the end of this introductory section.)

The two plans differ significantly, both in purpose and content. The *Health Manpower Plan* deals with California's need for and current supply of health professionals in several fields. The *Health Sciences Education Plan* indicates the level of enrollment and the output of training programs in these same health fields. After assessing the current situation, each plan makes recommendations concerning modifications of policies or courses of action which seem necessary.

A brief historical background may help to explain the Commission's involvement in the *Health Sciences Education Plan*. AB 1748 was introduced in 1975, but became a "two-year bill" and did not finally become law until 1976. Late in the 1975 Session, when it became obvious that the bill would be held over, Assemblyman Duffy obtained legislative approval of an augmentation to the Commission's budget together with budget control language requiring the Commission to make a first effort at carrying out a study of both the demand for and supply of health professionals in the several fields. The Legislature appropriated $150,000 to the Commission for the study.

Subsequently, the Commission contracted with Dr. John Wong, a consultant in health sciences education, to carry out the study. In spite of a very limited amount of time available for the study, Dr. Wong, by subcontracting out various sections of the report, was able to finish the project on schedule in April of 1976, at about the same time that AB 1748 was being adopted. The John Wong Report, as it is commonly called, in a single study pioneered the ground that was later explored by the Department of Health and the Commission in their respective plans.

The *Health Sciences Education Plan* is organized into seven chapters. The first five address the health fields identified in AB 1748: medicine, nursing, dentistry, optometry, and pharmacy. The sixth chapter explores the standing of underrepresented groups--women and certain ethnic minorities--in the health professions, and the current efforts to provide equal educational opportunity for these groups.

The final chapter reports on the "state of the art" in health sciences education planning, as the Commission perceives it upon completion of this Plan. Ongoing issues to be considered in future plans

6

are discussed, including problems of data collection, the jurisdictional overlap in planning, the utilization of mid-level professionals, the importance of an integrative view of health planning, the inherent limitations of health sciences education planning, and the need to develop planning that emphasizes wellness rather than illness.

In compliance with AB 1748 the Plan also considers the use of mid-level practitioners or auxiliaries in each of the five health fields, and the potential for substituting their services for those of the senior professionals. Although not delineated in the legislation, two fundamental assumptions seem to underlie the need for identifying such personnel:

1. From a societal perspective, it makes good economic sense to deliver health care at the lowest possible professional level commensurate with quality care.

2. From the perspective of both society and health professionals, it is wise to keep professionals as busy as possible with challenges which tax the upper ranges of their capabilities rather than the lower.

The five health disciplines have been examined according to the tripartite analysis called for in the legislation: (1) the adequacy of educational programs in meeting the needs identified in the Health Manpower Plan; (2) the adequacy of utilization of clinical resources throughout California; and (3) recommendations concerning program changes in health sciences education.

The bulk of the analysis, and the bulk of the collected data, in the Commission's Plan deals with the adequacy of present programs in the health sciences. The analysis covers:

- Output of programs, as measured by the annual number of graduates or completers;

- Enrollments in each program in recent years;

- Role of mid-level practitioners in each field and the nature of educational programs for these practitioners;

- Educational opportunities for those who are interested in careers in each field;

- Special considerations for educational planning in each health discipline; and

- Findings concerning the status and adequacy of education in each of the five health sciences.

Much of the Plan consists of the display of data, and the interpretation of data. The reader should be aware of the caveats that surround the heavy dependence on these data. First, the diversity of sources of data which are necessary to achieve any degree of completeness may introduce problems of noncomparability. The major sources of data used in this Plan are listed below:

- HEGIS—Higher Education General Information Survey
- University of California Statistical Summary
- California State University and Colleges Abstract
- Licensure Boards
- Professional Associations
- Segmental Administrations
- Individual Institutions
- Previous studies, e.g., the John Wong Report

It is obvious that these sources have different purposes in collecting, storing, and releasing data. As a result, data collection instruments, data elements, completeness, time-span, discreteness, classification, and degree of detail, all vary considerably from source to source.

Second, there is no way to verify certain data. Ethnicity, for example, is measured imprecisely because of the voluntary nature of its self-identification. HEGIS procedures, using guidelines of the federal Office of Civil Rights call for "no response" answers on ethnicity to be prorated among the other categories; with a large number of "no response" answers, the usefulness of such a procedure is questionable.

Third, the timeliness and completeness of data are always limitations in drawing conclusions. While most of the data in this Plan are reasonably recent, there are only a few years of data available for many of the trends displayed in the various tables.

SUMMARY OF RECOMMENDATIONS

The recommendations made in each of the chapters of the Plan are summarized below.

Medical Education

1. Because of the large and growing number of physicians now practicing or receiving graduate medical education in the State, no additional medical schools or sub-campuses of medical schools should be implemented or phased-in in California until the rate of in-migration drops markedly. During this time, existing and currently planned two-year programs should not be expanded beyond two-year status.

2. The State should determine the mode and degree of State influence on medical education programs, particularly residencies, which would achieve the most beneficial results in effecting desired distribution of medical specialties and optimum utilization of medical education as a means of providing health care in underserved areas.

3. The health manpower and health science education planners of the State should develop standards for assessing the adequacy of the total health care which is available to urban and rural Californians, reflecting normal patterns of mobility but taking into account the barriers--cultural, linguistic, economic, and psychological--which may affect the utilization of existing health care resources.

4. The State should provide for the certification of nurse practitioners and should further define this profession and the scope of its practice. The educational and experiential requirements for certification should be established at a standardized professional level, but should provide for a variety of paths to the attainment of those requirements.

5. The State should encourage, through appropriate means, the recruitment of medical students and residents from diverse backgrounds, cultures, and languages, and should encourage, through the medical education programs it supports, the development of sensitivity on the part of physicians to the needs of people as individuals and as members of diverse cultures and groups.

Nursing Education

1. The Postsecondary Education Commission, together with the Division of Health Professions Development in the Office of Statewide Health Planning and Development, should jointly establish a task force to make a differentiated assessment of statewide nursing-care needs and manpower resources. This group should be made up of nursing educators, health planners, hospital spokespersons, legislative staff, representatives of licensure boards and professional associations, working nurses, et al. The task force should explore ways of determining the supply of and demand for

nurses, including specialists; resolve problems in the education, employment, and retention of the proper number and types of nurses; and assist various agencies and organizations to work together toward fuller utilization of nursing manpower resources.

2. In order to achieve better coordination and articulation, the two boards now licensing nurses--the Board of Registered Nursing and the Board of Vocational Nurse and Psychiatric Technician Examiners--should be combined into a single board with responsibilities for all licensure of patient-care personnel.

Dental Education

1. The State should clarify and codify the scope of practice of extended-function dental auxiliaries, and should provide educational programs to prepare Californians for these paraprofessional fields.

2. Greater use should be made of expanded role dental auxiliaries, particularly in meeting dental needs in underserved areas.

3. Additional minority students should be recruited for careers as dental auxiliaries as a means of facilitating community screening and peer counseling which will provide assistance and support to people in underserved areas who need further dental care.

Pharmaceutical Education

1. The State should provide in statute and regulation for the delineation of function between a professional pharmacist and a pharmacy technician, and should provide appropriate educational programs in each field, taking into account the variety of roles which pharmacists may fill, ranging from traditional retail dispensing of drugs to the delivery of primary health care.

Optometric Education

1. The State should include optometry in the AB 1503 experimental health manpower programs in order to explore possible new roles for optometrists in primary health care, and for optometric technicians in-patient care.

2. Future health manpower plans prepared by the Office of Statewide Health Planning and Development should investigate the overlapping responsibilities of optometrists and ophthalmologists in providing vision care, and should recommend public policies with respect to the utilization of each kind of vision specialist.

Equal Educational Opportunity

1. California institutions should continue outreach, recruiting, and admissions programs to increase the number of minority and women undergraduates as a means of increasing the numbers eligible for programs in the health sciences.

2. Monitoring of educational opportunities in the health professions should be a part of any ongoing monitoring of affirmative action activities by segmental headquarters and such agencies as the California Postsecondary Education Commission. As a part of such monitoring, those special State and federal programs presently operating to increase enrollment of ethnic minorities and women in the health sciences should be evaluated by January 1, 1981, to determine their effectiveness.

3. California institutions should continue to recruit and admit additional, qualified ethnic minorities and women in the health sciences to offset the historic underrepresentation of these groups. Women, as a group, are underrepresented in proportion to their numbers as college graduates, as well as their numbers in the total population. They should be given special priority in these recruiting and admission efforts.

4. All entities of State government which support, govern, or administer education, from the Legislature to local campuses and public school systems, should increase their efforts to identify and overcome those barriers which have prevented minorities and women from participating fully in professional education in the health sciences. Such efforts should be assigned high priority in the allocation of public resources of time and money.

Enabling Legislation

The text of AB 1748, the legislation calling for the Health Sciences Education Plan, appears below.

Assembly Bill No. 1748

CHAPTER 600

An act to add Sections 22712.5, 22712.6, and 22712.7 to the Education Code, and to add Article 19 (commencing with Section 429.94) to Chapter 2 of Part 1 of Division 1 of the Health and Safety Code, relating to health services.

[Approved by Governor August 26, 1976. Filed with Secretary of State August 27, 1976.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1748, Duffy. Health manpower planning and education.

Existing law provides for a state medical contract program to provide aid for education and training in the area of primary care family physicians' services and provides for a Health Manpower Policy Commission with specified duties in such connection.

The bill would require the State Department of Health to prepare a Health Manpower Plan containing specified elements for California. The bill would require the State Department of Health to issue an updated Health Manpower Plan to the Legislature, Governor, and the California Postsecondary Education Commission on or before September 1, 1977, and biennially thereafter. The bill would require the California Postsecondary Education Commission to issue a Health Sciences Education Plan, based on the Health Manpower Plan issued by the state department, and to issue an updated Health Sciences Education Plan to the Legislature and the Governor on or before March 1, 1978, and biennially thereafter.

The people of the State of California do enact as follows:

SECTION 1. Section 22712.5 is added to the Education Code, to read:

22712.5. The commission shall issue a Health Sciences Education Plan which shall take into account the Health Manpower Plan issued by the State Department of Health pursuant to Section 429.96 of the Health and Safety Code.

SEC. 2. Section 22712.6 is added to the Education Code, to read:

22712.6. The Health Sciences Education Plan shall consist of at least the following elements:

(a) A finding, taking into account the findings of the Health Manpower Plan issued by the State Department of Health, as to whether health sciences education enrollment levels are adequate to meet the needs in California for health personnel, by category and specialty within each category.

(b) A finding as to the extent to which the sites of health sciences training programs make maximum available use of existing clinical and classroom resources throughout the state.

(c) Recommendations concerning the establishment of new programs or the elimination of existing programs in health sciences according to findings in subdivisions (a) and (b).

SEC. 3. Section 22712.7 is added to the Education Code, to read:

22712.7. The commission shall issue an updated Health Sciences Education Plan and recommendations to the Legislature and the Governor on or before March 1, 1978, and on or before March 1 of every even-numbered calendar year thereafter.

SEC. 4. Article 19 (commencing with Section 429.94) is added to Chapter 2 of Part 1 of Division 1 of the Health and Safety Code, to read:

Article 19. Health Manpower Planning

429.94. The state department shall prepare a Health Manpower Plan for California. The plan shall consist of at least the following elements:

(a) The establishment of appropriate standards for determining the adequacy of supply in California of at least each of the following categories of health personnel: physicians, midlevel medical practitioners (physician's assistants and nurse practitioners); nurses; dentists; midlevel dental practitioners (dental nurses and dental hygienists); optometrists; optometry assistants; pharmacists; and pharmacy technicians.

(b) A determination of appropriate standards for the adequacy of supply of the categories in subdivision (a) shall be made by taking into account all of the following: current levels of demand for health services in California; the capacity of each category of personnel in subdivision (a) to provide health services; the extent to which midlevel practitioners and assistants can substitute their services for those of other personnel; the likely impact of the implementation of a national health insurance program on the demand for health services in California; professionally developed standards for the adequacy of the supply of health personnel; and assumptions concerning the future organization of health care services in California.

(c) A determination of the adequacy of the current and future supply of health personnel by category in subdivision (a) taking into account the sources of supply for such personnel in California, the magnitude of immigration of personnel to California, and the likelihood of such immigration continuing.

(d) A determination of the adequacy of the supply of specialties within each category of health personnel in subdivision (a). Such determination shall be made, based upon standards of appropriate supply to specialty developed, in accordance with subdivision (b).

(e) Recommendations concerning changes in health manpower policies, licensing statutes, and programs needed to meet the state's need for health personnel.

429.95. The state department shall consult with the Health Manpower Policy Commission, health systems agencies, and other appropriate organizations in the preparation of this plan.

429.96. The state department shall issue an updated Health Manpower Plan and recommendations to the California Postsecondary Education Commission, the Legislature, and the Governor on or before September 1, 1977, and on or before September 1 of each odd-numbered calendar year thereafter.

CHAPTER I

MEDICAL EDUCATION

California has eight medical schools. Five are located on campuses of the University of California: Davis, Irvine, Los Angeles, San Diego, and San Francisco. The other three are operated by independent institutions: Loma Linda University, Stanford University, and the University of Southern California.

There also are three institutions which provide some portion of medical education. The Riverside and Berkeley campuses of the University have small basic medical science programs which prepare students for clinical training at the Los Angeles and San Francisco campuses, respectively. The Charles R. Drew Postgraduate Medical School in Compton, a private institution operating with partial State support, offers graduate medical education. Recently, the School concluded an agreement with the Regents of the University of California to provide third- and fourth-year clinical education for UCLA medical students.

In addition to eight medical schools there are hundreds of sites around the State which provide clinical training and/or postgraduate specialty training in various residencies. These sites, which are generally hospitals, have tended in the past to be reasonably close geographically to the medical schools with which they are affiliated, a significant exception being a cluster of clerkships, preceptorships, and residencies in Fresno affiliated with the University of California at San Francisco. In recent years, decentralization of residencies has taken place in some areas of the State.

Before examining the nature and scope of California's programs for training physicians, it would be well to offer an additional explanation of graduate medical education. Some graduate education is in the area of advanced academic specialties such as physiology or pathology, and leads to graduate degrees. Enrollments and outputs of these programs can be identified readily by the educational planner, but are not relevant to the Commission's plan; they represent physicians (and nonphysicians) becoming more highly qualified academically, rather than additional new physicians being trained or new specializations acquired. Such physicians, however, are an important source of future teachers and researchers in medical education.

A much greater portion of graduate medical education takes the form of residency training. Residencies lead neither to advanced degrees nor to licensure—the goals of most professional education programs.[1]

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[1] The traditional one-year, post-M.D. internship required for licensure is now treated as the first year of residency. Thus, all medical graduates participate in at least one year of residency training in order to become licensed.

Rather, they lead to certification by an appropriate specialty board, with a commensurate choice of career specialization for the physician. Unlike graduate medical programs, residencies are relatively difficult for the educational planner to identify, but are very important for planning purposes since choice of residency determines the future mix of medical specialists.

In considering medicine as the first of five health science disciplines under review, the Commission's plan will explore: (1) the quantitative adequacy of programs, as measured by outputs and enrollments; (2) programs for mid-level practitioners; (3) the adequacy of opportunities for medical training; (4) special considerations in medical education planning; and (5) the adequacy of utilization of clinical sites and facilities for medical education.

ADEQUACY OF PROGRAM SIZE

In its Health Manpower Plan, the Department of Health made four basic findings relative to the supply of physicians in California:

1) There is not now and there is not anticipated to be (in the next five to ten years) an overall shortage of physicians in California.

2) There is now a geographic maldistribution of physicians in California. While some urban areas of the State have an abundance of physicians available, over 3.4 million Californians (primarily minority persons residing in urban barrios and ghettos of the State, as well as many rural Californians) do not have adequate access to physician services.

3) There is now a specialty maldistribution with shortages in family practice/general practice on the one hand, and with substantial, and apparently increasing, surpluses of physicians in many specialties.

4) There are insufficient minority physicians who can provide linguistic and culturally sensitive health services to the 25% of the State's population who are underrepresented in the health professions.

Thus, the situation to which the Postsecondary Education Commission responds in this, its first, Health Sciences Education Plan is essentially, in the case of physicians, one of geographic and specialty maldistribution and of a shortage of minority physicians.

There appear to be several basic assumptions which underlie the recommendation in the Health Manpower Plan:

1. Determining what is an adequate number of physicians is an imprecise art. The Health Manpower Plan quotes Ruth Hanft, a health care expert, as saying, "There is no scientific, right, or rational method of estimating what kinds of health manpower a nation, state, or area needs, and we will use judgments, proxies, and insufficiently substantiated assumptions to determine numbers."

2. The adequacy of the supply of physicians is measured in terms of physician response to illness, not wellness, although maintaining wellness is the preferred goal of medical care.

3. The in-migration of physicians into California from other states will continue at the same level.

4. No significant changes will occur in the present organization and funding of health-care delivery services.

While accepting the Department of Health's findings, the Commission is aware that their relevance for the future depends to a large degree upon the validity of and limitations imposed by the basic assumptions of the Health Manpower Plan.

In reporting on the size and scope of physician training programs in California, the Commission has assembled information on: (1) the output of training programs (for medical schools, the number of M.D. degrees conferred; for residencies, the number of new specialists being certified); (2) the enrollment levels in medical education and various residencies; and (3) the admissions success of applicants to medical school. The composition of recent graduating classes and current enrollments by sex and ethnicity will be covered in a later chapter devoted to equal educational opportunity and affirmative action.

Output of California Medical Schools and Residencies

Table M-1 indicates the number of graduates of California medical schools from 1965-66 through 1976-77. During the past twelve years, the annual output of these schools has doubled. Not only has the number of graduates increased, but two new medical schools have been opened during this period at the Davis and San Diego campuses of the University.

The output of independent institutions has increased by 89 percent and that of public institutions by 111 percent. Only one medical school, the University of California at Irvine, did not increase its output of graduates during this decade.

TABLE M-1

M.D. Degrees Awarded at California Institutions

ACADEMIC YEAR

Medical School	1965 1966	66 67	67 68	68 69	69 70	70 71	71 72	72 73	73 74	74 75	75 76	76 77	77 78
UCSF	99	101	128	130	126	131	122	133	136	137	156	139	148
UCLA	70	68	76	71	78	113	130	136	132	144	158	158	152
UCD	-	-	-	-	-	-	46*	49	50	95	99	101	89
UCI	88	87	89	75	58	64	64	67	63	64	74	82	76
UCSD	-	-	-	-	-	-	45*	50	52	48	65	59	88
Total Public	257	256	293	276	262	308	407	435	433	488	552	539	554
USC	63	71	67	69	73	74	84	85	103	97	113	134	136
Stanford	54	48	61	61	69	69	75	88	74	81	72	107	94
Loma Linda	89	88	83	69	85	95	97	220	133	83	157	151	143
Total Private	206	207	211	199	227	238	256	393	310	261	342	392	373
Grand Total	463	463	504	475	489	546	663	828	743	749	894	931	927

*First graduating class

Sources: John C. Wong, Health Manpower Study of Selected Health Professions in California, 1976; and the Higher Education General Information Survey.

Table M-2, on page 5, shows the estimated 1977 output of newly certified physicians from nonfederal residencies and from federal/military residencies.

In analyzing this table, one should remember that residencies are not generally subject to close coordination and control by the State. Residencies are sponsored by hospitals, which are responsible for paying the stipends of the residents—approximately $15,000 per annum. State funds go directly only to residencies connected with the University of California or with State hospitals. (Additional State funds may be awarded by the Health Manpower Policy Commission to hospitals for family-practice residencies under the Song-Brown Act.) In the University's teaching hospitals, one faculty position is authorized for every seven residents, and in affiliated hospitals, one for every ten residents. Within the University of California, 36 percent of the residencies are in teaching hospitals, and 64 percent are in affiliated hospitals. All of these positions are subject to State coordination, at least through the budget review process.

TABLE M-2

Estimated 1977 Output of Specialists Completing Residencies in California

Primary Care	Non-Federal Annual Completions	Federal/Military Annual Completions
General Practice	18	0
Family Practice	200	16
Internal Medicine	646	36
Pediatrics	348	26
Obstetrics/Gynecology	132	17
Total	1,344	95
Non-Primary Care		
Anesthesiology	107	12
Dermatology	37	6
Neurological Surgery	16	0
Neurology	49	2
Nuclear Medicine	14	2
Ophthalmology	65	7
Orthopedic Surgery	73	10
Otolaryngology	38	6
Pathology	107	10
Forensic Pathology	1	0
Neuropathology	1	0
Pediatrics-Allergy	2	0
Pediatrics-Cardiology	1	0
Physical Medicine & Rehabilitation	13	1
Plastic Surgery	12	0
Public Health	1	0
Occupational Medicine	0	0
General Preventive Medicine	2	0
Psychiatry	314	14
Psychiatry-Child	43	3
Radiology	22	0
Radiology-Diagnostic	128	17
Radiology-Therapeutic	19	1
Surgery	216	15
Surgery-Thoracic	15	2
Surgery-Urological	35	5
Allergy/Immunization	7	0
Emergency Medical Services	24	0
Fellows	45	4
Interns	28	14
Medical Specialties	117	0
Pediatric Specialties	32	0
Other	1	0
Flexible	80	12
Total	1,665	143
Total, All Specialties	3,009	238

Source: 1977 Health Department Survey of Residencies. Figures are estimates.

Residencies which are not affiliated with the University of California—52 percent of the total in the State—are subject to little or no statewide planning and coordination, even though they may indirectly receive State assistance in the form of Medi-Cal payments which go to hospitals for services provided to patients. These payments become a part of the hospital's total operating budget from which residencies are funded.[2]

It is also useful to keep in mind that the accreditation of residencies is provided by the Liaison Committee on Graduate Medical Education, a national organization representing various interest groups, including those of medical education and hospital administration. Affiliation with a medical school is not a requirement for accreditation; only about 63 percent of the residency positions in California are in programs affiliated with a medical school.

Several interesting observations can be made from this display of the output of residencies:

1. Approximately 3,200 physicians complete residencies and become certified in California each year, a much larger number of physicians than the 900 or so who graduate from medical school. Yet, public educational policies have paid more attention to the output of medical schools than to the output of residencies.

2. The output of new primary-care specialists is 45 percent of the total output of new specialists, short of the 50 percent which federal and State planners have indicated is the desired goal. Further, the 45 percent figure may overstate the number of primary-care physicians who are ready to practice, since some of those in internal medicine and pediatrics may actually be moving toward a specialization within those fields.

3. More than 90 percent of the newly certified specialists are available for civilian health care if they choose to stay in California. The balance have been trained in federal and military programs, although these physicians may also be available for civilian medicine if they leave the service and locate in California.

4. There is relatively low output from residencies identified by the Department of Health as being particularly desirable: occupational medicine, preventive medicine, and public health.

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[2] Further public support of residencies occurs in tax-supported hospitals which offer residencies: in California, seventeen federal hospitals, twleve State hospitals, and eighteen local hospitals.

Enrollments in California Medical Schools and Residencies

Enrollments in California medical schools are displayed in Table M-3. Actual fall enrollments are reported for 1972-77, and projected enrollments are indicated for 1978-81.

Table M-3 shows that enrollments in California medical schools have grown 23.0 percent during the past five years, but have leveled off in the last two. Enrollment growth rates have been similar for public institutions (22.4%) and private institutions (23.8%). During this time, the overall number of graduates has risen 40 percent, suggesting that the slower rate of enrollment increase will soon be reflected in a slower rate of increase in graduates. The projections for the University's five medical schools are from a 1975 plan for the health sciences submitted to the Legislature. As Table M-3 indicates, the University anticipates increased enrollments at Irvine, Los Angeles, and San Diego.

TABLE M-3

Enrollment in California Medical Schools

	Actual							Projected		
Medical School	1972 1973	73 74	74 75	75 76	76 77	77 78	78 79	79 80	80 81	81 82
UCD	293	347	401	408	405	402	406	400	400	400
UCI	258	246	257	301	308	293	312	364	377	386
UCLA	550	557	604	617	598	582	596	632	656	656
UCR	-	-	-	-	-	16	35	48	48	48
UCSD	211	235	275	318	340	380	420	456	488	512
UCSF	555	565	575	633	590	613	626	616	616	616
Total Public	1,867	1,950	2,112	2,277	2,241	2,286	2,395	2,516	2,585	2,618
Loma Linda	456	599	627	640	572	571	642	NA	NA	NA
Stanford	334	370	374	396	352	387	340	369	NA	NA
USC	445	439	472	517	541	570	587	570	560	560
Total Private	1,235	1,408	1,473	1,[illegible]3	1,465	1,528	1,569	NA	NA	NA
Grand Total	3,102	3,358	3,585	3,830	3,706	3,814	3,964	NA	NA	NA

Sources: UC Statistical Summary; HEGIS; UC Office of Health Affairs.

The total number of residency positions currently filled in California is displayed in Table M-4. Although "enrollment" is not a term ordinarily used in connection with residencies, the number of filled positions corresponds to the enrollment of residents. Residents are sometimes identified as "house staff," which makes it more difficult to think of them as students enrolled in a training program.

TABLE M-4

Estimated Number of Residents in Training in California, 1977

Primary Care	Number in Training, Non-Federal	Number in Training, Military/Federal	Number in Training, Total
General Practice	36	0	36
Family Practice	599	47	646
Internal Medicine	1,939	110	2,049
Pediatrics	696	52	748
Obstetrics/Gynecology	462	58	520
Total	3,732	267	3,999
Non-Primary Care			
Anesthesiology	322	36	358
Dermatology	110	18	128
Neurological Surgery	65	0	65
Neurology	146	6	152
Nuclear Medicine	29	4	33
Ophthalmology	195	22	217
Orthopedic Surgery	291	40	331
Otolaryngology	153	24	177
Pathology	322	30	362
Forensic Pathology	3	0	3
Neuropathology	2	0	2
Pediatrics-Allergy	4	0	4
Pediatrics-Cardiology	1	0	1
Physical Medicine & Rehabilitation	38	3	41
Plastic Surgery	30	0	30
Public Health	3	0	3
Occupational Medicine	0	0	0
General Preventive Medicine	7	0	7
Psychiatry	628	29	657
Psychiatry-Child	85	6	91
Radiology	66	0	66
Radiology-Diagnostic	385	53	438
Radiology-Therapeutic	58	3	61
Surgery	863	58	921
Surgery-Thoracic	30	3	33
Surgery-Urological	105	15	120
Allergy/Immunization	15	0	15
Emergency Medical Services	47	0	47
Fellows	181	18	199
Interns	113	58	171
Medical Specialties	352	0	352
Pediatric Specialties	96	0	96
Other	1	0	1
Flexible	321	48	369
Total	5,067	474	5,541
Total, All Specialties	8,799	741	9,540

Source: 1977 Health Department Survey of Residencies.

An analysis of the data in Table M-4 reveals that the percentage of residency positions in primary care is 44 percent overall, and 43 percent for nonfederal residencies. This is well short of the 50 percent which federal and State planners have indicated is the desired goal in primary care by 1980. More residency positions are available in internal medicine than any other field, followed by surgery, psychiatry, pediatrics, family practice, and obstetrics/gynecology. Thus, four of the six most popular residencies are in primary care. Nevertheless, the net effect of large numbers of residencies in areas such as anesthesiology, ophthalmology, orthopedic surgery, otolaryngology, pathology, and radiology is to outnumber the residencies in primary care.

One of the characteristics of the State's total population of medical residents is that most of them are not graduates of California medical schools. Table M-5 indicates the source of residents who train in California.

TABLE M-5

Source of Residents in California Residency Programs

	Number from Calif. medical schools	Number from other American/Canadian medical schools	Number from foreign medical schools	Total number of residents
1972-73	1,562 (28%)	3,706 (66%)	338 (6%)	5,606
1973-74	1,708 (28%)	4,152 (67%)	342 (5%)	6,202
1974-75	1,750 (28%)	4,204 (67%)	326 (5%)	6,280
1975-76	1,866 (31%)	3,861 (64%)	273 (5%)	6,000

Source: JAMA Medical Education Issue and AMA Directory of Accredited Residencies, 1977-78.

It is clear that residencies provide graduate education to many people from out of state. With several thousand first-year residency positions to be filled each year, and less than one thousand new M.D.s being graduated annually from California medical schools, the State must look to out-of-state graduates. Thus, a characteristic of graduate medical education in California is a high percentage of nonresident students.

Enrollments in residencies affiliated with California medical schools are displayed in Table M-6. Two problems in the collection of residency data are worth noting. First, it is necessary to gather data on affiliated residencies from several sources,[3] which introduces the risk of noncomparable data. Second, there are a number of residencies which are not affiliated with medical schools, and therefore go unreported in such a summary. The Department of Health's survey of residencies in 1977 identified 8,799 filled nonfederal residencies in California (Table M-4); Table M-6 identifies only 5,551 (63%) that are affiliated with medical schools.

TABLE M-6

Enrollments in Affiliated Residencies

Institution	Year 1973-74	1974-75	1975-76	1976-77	1977-78
UCD	290	403	451	481	543
UCI	416	540	454	502	565
UCLA	1,266	1,317	1,405	1,478	1,541
UCSD	333	349	360	380	390
UCSF	696	812	837	1,044	1,003
Total, UC	3,001	3,421	3,507	3,885	4,042
Loma Linda	147	190	175	213	224
Stanford	332	365	361	376	523
USC	927	854	913	867	762
Total, Private	1,406	1,409	1,499	1,456	1,509
Total, All	4,407	4,830	4,956	5,341	5,551

Sources: 1973-76, JAMA; 1972, UC Statistical Summary; 1977 Department of Health Survey.

This summary of enrollments in affiliated residencies has been compiled from several sources. As shown, the number of affiliated residency positions in California has increased by 26.0 percent during the past five years. Most of this growth has occurred in the University of California, where residency positions have increased by 34.7 percent. In the three independent medical schools, the number of residency positions increased only 7.3 percent during the five-year period. It should be noted that some growth in residencies may be more apparent than real, representing better accounting of existing programs and affiliation of existing programs.

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[3] No single source exists for residency data as an educational statistic. HEGIS does not report residencies since they are not degree-oriented programs. The Commission's information system has data for only the most recent enrollments. The Journal of the American Medical Association reports residency enrollment only since 1974 in a comparable form, and also has a time lag of a year. The Department of Health survey was conducted by telephone to obtain 1977 data.

Although information on the distribution of residencies by specialty is not available for California medical schools as a group, it is available for the University of California. Table M-7 displays the number of residency positions budgeted for the University in 1977-78 and 1978-79, and the number of positions by specialty budgeted for each of the five medical schools in 1978-79.

From Table M-7 one can conclude that emphasis on primary-care specialties in University residencies varies from campus to campus. Davis has 49.0 percent of its residency positions in primary-care specialties, Irvine has 46.7 percent, Los Angeles has 45.3 percent, San Francisco has 43.0 percent, and San Diego has 39.1 percent. In the University's 1978-79 budget, primary-care specialty housestaff positions were increased 4.3 percent over 1977-78, while nonprimary-care positions were increased 3.5 percent.

TABLE M-7

Current Distribution of Residencies, UC

Primary Care	UC 77-78	UC 78-79	UCD 78-79	UCI 78-79	UCLA 78-79	UCSD 78-79	UCSF 78-79
Family Practice	403	484	127	53	166	49	89
Internal Medicine	922	868	93	147	361	64	203
Obstetrics/Gynecology	201	203	26	24	80	19	54
Pediatrics	252	301	36	51	70	35	109
Flexible	63	64	0	0	34	0	30
Total	1,841	1,920	282	275	711	167	485
Non-Primary Care							
Allergy and Immunology	11	13	0	4	6	3	0
Anesthesiology	162	160	16	8	56	23	57
Dermatology	55	56	2	10	23	5	16
Emergency Medicine	0	32	0	0	20	0	12
Internal Medical Specialties	310	370	40	54	191	12	73
Neurological Surgery	33	31	5	6	9	1	10
Nuclear Medicine	15	23	8	5	1	2	7
Ophthalmology	81	74	8	9	26	6	25
Orthopedic Surgery	121	119	12	15	30	16	46
Otolaryngology	69	65	9	7	20	8	21
Pathology	154	158	18	21	49	29	41
Pediatric Specialties	104	94	4	10	54	2	24
Physical Medicine and Rehab.	25	31	9	13	9	0	0
Plastic Surgery	18	18	2	4	6	2	4
Psychiatry and Neurology							
Psychiatry	319	301	33	38	118	36	76
Child Psychiatry	47	60	6	7	29	4	14
Neurology	85	88	12	9	33	18	16
Radiology							
Diagnostic Radiology	197	184	30	30	43	26	55
Therapeutic Radiology	30	27	3	2	6	2	14
Surgery-General	392	403	68	49	115	55	116
Thoracic Surgery	12	12	2	4	2	2	2
Urology	50	50	7	8	14	8	13
Vascular Surgery	1	1	0	1	0	0	0
Total	2,291	2,370	294	341	860	260	642
Total, All Specialties	4,132	4,290	576	589	1,571	427	1,127

Source: UC Office of Health Affairs.

The distribution of residencies in the University system over six years can be seen in Table M-8, which shows the number of positions utilized in each specialty. Because of changes in terminology, and the elimination of the "internship" category, the first two years of the table are comparable, and the last four years are comparable, but not the entire table. Overall totals for the six years are comparable, however, as are totals for those specialties which retain distinct identities throughout the period.

According to these data, which are furnished to the Department of Finance by the University, the number of budgeted residency positions has increased by 45 percent over the last five years. The number of positions in primary-care specialties increased even faster: family practice, 340 percent; internal medicine, 128 percent; pediatrics, 87 percent; obstetrics/gnynecology, 52 percent. It is interesting to note the discrepancy between the overall rate of growth of residencies in the University as noted in this table--45 percent—and as noted in Table M-6—54.2 percent. The data in Table M-6 are gathered by the American Medical Association and the Association of American Medical Colleges directly from medical schools, while the data in Table M-8 are gathered by the President's office of the University of California. The obvious differences in the two tables highlight the problem of comparability of data in a health sciences education plan such as the Commission's.

It is also apparent from Table M-8 that the percentage of University residencies in primary care has been increasing markedly each year: in 1978-79, 44.8 percent of the residencies are in primary-care specialties, up from 37.3 percent just three years earlier. As noted previously, some of this growth may reflect affiliations of existing programs, rather than the creations of new programs.

To summarize, the data on output and enrollment of medical education and graduate medical education in California show a pattern of vigorous growth in recent years. This growth

1. is somewhat faster in the public sector than in the private sector;

2. is considerably greater for graduate medical education than for professional medical education;

3. is considerably greater for primary-care residencies than for non-primary care;

4. has not yet produced a balance between primary care and non-primary care among newly certified physicians;

5. is fed, in the case of residencies, by heavy in-migration of new residents from other states and countries;

TABLE M-8

University of California Residency Positions by Specialization

	Actual 1973-74	Actual 1974-75
Interns:	576	638
Residents:		
Allergy	11	9
Anesthesiology	115	127
Cardiology	67	64
Dermatology	50	52
Endocrinology	22	23
Family Medicine	110	162
Gastroenterology	39	30
Hematology	19	15
Immunology	2	2
Infectious Diseases	17	19
Internal Medicine	381	484
Nephrology	29	24
Neurology	74	77
Neurosurgery	27	28
Nuclear Medicine	7	7
Obstetrics/Gynecology	97	103
Ophthalmology	74	74
Orthopedic Surgery	110	130
Otorhinolaryngology	54	68
Pathology	106	121
Pediatrics (general)	161	198
Physical Medicine and Rehabilitation	18	23
Plastic Surgery	14	15
Psychiatry	262	274
Pulmonary and Respiratory Diseases	26	22
Radiology	176	192
Rheumatology	20	17
Surgery (general)	226	242
Thoracic Surgery	8	9
Urology	49	51
Other	5	6
Total	2,952	3,306

Source: Governor's Budget Book.

	Actual 1975-76	Actual 1976-77	Actual 1977-78	Budgeted 1978-79	Proposed 1979-80
Residents:					
Flexible	-	61	62	64	65
Allergy and Immunology	88	8	13	13	12
Anesthesiology	12	155	153	160	162
Dermatology	153	52	54	56	56
Emergency Medicine	54	-	6	32	52
Family Practice	254	357	406	484	514
Internal Medicine	725	828	843	868	875
Medical Specialties	309	342	376	370	370
Neurological Surgery	32	31	31	31	29
Nuclear Medicine	7	13	17	23	24
Obstetrics and Gynecology	147	193	199	203	215
Ophthalmology	77	74	74	74	73
Orthopedic Surgery	126	120	129	119	120
Otolaryngology	68	65	61	65	65
Pathology	148	156	153	158	157
Pediatrics	213	242	282	301	323
Pediatric Specialties	107	106	94	94	94
Physical Medicine and Rehabilitation	21	21	31	31	34
Plastic Surgery	15	18	16	18	18
Psychiatry and Neurology					
Psychiatry	293	298	305	301	302
Child Psychiatry	48	46	61	60	60
Neurology	81	83	86	88	88
Radiology					
Diagnostic Radiology	150	184	176	184	184
Therapeutic Radiology	28	23	21	27	25
Surgery (general)	382	389	382	403	401
Thoracic Surgery	9	12	11	12	12
Urology	45	51	53	50	50
Vascular Surgery	-	1	1	1	1
Occupational Medicine	-	-	-	-	4
Total	3,592	3,929	4,096	4,290	4,392

6. appears, in the case of medical school enrollment, to have leveled off during the past two years.

These data do not necessarily establish the adequacy of California's total medical education effort without reference to some standard or criterion. However, they do suggest that if this program has brought California to its present situation—which the Department of Health identifies as an adequate supply of physicians—and if the program continues to grow somewhat faster than the State's population, then we apparently have a medical education program more than adequate for our needs, given the continued in-migration of physicians.

MID-LEVEL PRACTITIONERS

Medicine like other health fields utilizes paraprofessionals, or mid-level practitioners, in the delivery of health care. The principal mid-level practitioners in medicine are the physician's assistant (P.A.) and the nurse practitioner (N.P.). These two occupational classifications have been widely heralded as a new generation of health professionals who could extend the effectiveness of the physician and provide quality health care.

The physician's assistant is a certified category of health professional regulated by the Board of Medical Quality Assurance under provisions of California's Business and Professions Code. The nurse practitioner is not specifically a licensed category of health professional in California, although recent legislation has directed the Board of Registered Nursing to provide for standards for those who wish to call themselves nurse practitioners. There is statutory provision for the certification of one other category of mid-level practitioner closely related to the nurse practitioner: the nurse midwife.

Physician's assistants have generally been utilized in a fairly narrow range of activities in the offices of physicians and in health care institutions. Nurse practitioners have functioned more autonomously and diversely, and in some instances have operated at some distance from the physicians to whom patients needing additional care are referred. Programs for physician's assistants do not show much growth; this static condition may suggest lesser career opportunities, mobility, and acceptance by the public and the medical profession for physician's assistants than for nurse practitioners.

Training programs in California for mid-level practitioners are difficult to identify and measure through standard educational reporting mechanisms, inasmuch as they are largely not degree oriented and do not even have a clearly defined level of instruction, such as upper division, graduate, etc. Although statutes indicate that a graduate of a physician's assistant program should have the equivalent of an

A.S. degree, none of the Community College physician's assistant programs listed in the Commission's *Inventory of Academic and Occupational Programs in California Colleges and Universities* is approved by the State; neither is the lone B.S. program which is listed.

Nurse practitioner programs are equally imprecise about the educational level of instruction. Graduates of two-year nursing programs are trained in nurse practitioner programs along with graduates of three-year programs, B.S. programs, and conceivably even master's programs. Some of the N.P. programs award a certificate, and others award a bachelor's or master's degree.

It is somewhat easier to identify physician's assistant programs, inasmuch as they are subject to approval by the Physician's Assistant Examining Committee of the Board of Medical Quality Assurance. Nine such programs have been approved in California, along with twenty-six out-of-state programs. The California programs and their emphases are as follows:

Stanford/Foothill College	Primary Care
Stanford/San Jose Hospital	Emergency Care
UCLA/Drew Postgraduate Medical School	Primary Care
UCLA/Drew/Martin Luther King, Jr. General Hospital	Emergency Care
USC/Cerritos College	Orthopedics
USC/L.A. City College	Primary Care
USC/L.A. County Medical Center	Emergency Care
UCSD/University Hospital	Allergy
UCLA/Harbor General Hospital	Obstetrics/Gynecology

It is understandably difficult to obtain enrollment and output information on these programs. However, the Health Professions Development section of the Department of Health has the following cumulative totals of graduates:

Program	Total Graduates
Stanford	93
Drew	129
USC	69
UCSD	N/A (reportedly defunct)
Harbor General	77

The most readily identifiable nurse practitioner programs are those in family practice funded by the Song-Brown Act and monitored by the Health Manpower Policy Commission. The following programs are in that category:

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UCD	Family Nurse Practitioner Master's degree/certificate
Drew/King	Family Nurse Practitioner Certificate
UCLA	Family Nurse Practitioner Master's degree
Sonoma State College	Family Nurse Practitioner B.S. degree/certificate

The Health Manpower Policy Commission has also identified nurse practitioner programs in areas other than family practice. These include:

L.A. County/Harbor General	Women's Health Care N.P.
UCLA	Primary Ambulatory Care N.P., Pediatric N.P.
UCSF	Adult Care N.P.
CSU, Long Beach	Primary Care, Pediatrics, Geriatrics N.P.
UCSD	Primary Care (Obstetrics/Gynecology, Pediatrics, Family) N.P.

The Health Manpower Policy Commission has identified the total cumulative output of these programs as follows:

Program	Cumulative Total of all Graduates
UCD Family Nurse Practitioner	220
Drew/King Family Nurse Practitioner (formerly Adult Care)	21
UCLA Primary Ambulatory Care Nurse Practitioner	64
Sonoma State College Family Nurse Practitioner	58
L.A. County Harbor General Women's Health Care N.P.	86
UCSF Adult Care Nurse Practitioner	50
CSULB Primary Care, Pediatrics, and Geriatrics N.P.	14
UCSD Primary Care (Obstetrics/Gynecology, Pediatrics, and Family) Nurse Practitioner	60
UCLA Pediatric Nurse Practitioner (now defunct)	90

Nurse practitioner programs in other areas also appear on lists of programs obtained from various sources: pediatric nurse associate, women's health care specialist, obstetrics/gynecology nurse specialist, primary care assistant, medical nurse specialist, etc. Many of these designations are identified with programs authorized under AB 1503 (Chapter 1350, Statutes of 1972) as Experimental Health

Manpower Pilot Projects.[4] Some of these categories, however, seem quite loosely defined; the line between what is postgraduate specialty training in nursing and what is only a continuing education program is not very precise at this point.

The result of this imprecise designation is a lack of understanding of the role of nurse practitioners. The Legislature expressed its concern about this problem in a recently enacted section of the Business and Professions Code:

> The Legislature finds that various and conflicting definitions of the nurse practitioner are being created by state agencies and private organizations within California. The Legislature also finds that the public is harmed by conflicting usage of the title of nurse practitioner and lack of correspondence between use of the title and qualifications of the registered nurse using the title. Therefore, the Legislature finds the public interest served by determination of the legitimate use of the title "nurse practitioner" by registered nurses. (Section 2834.)

National certification of specialized competence exists in nursing, making it possible for a pediatric nurse practitioner or family nurse practitioner to be so designated. The Board of Registered Nursing does not give legal sanction to such credentials, however. Reflecting the orientation of the Department of Consumer Affairs, the Board believes that the State should not delegate the approval or certification process to a private organization. There is a conspicuous exception to this general principle, however, in the certification of nurse-midwives by the Board; requirements for State certification of nurse-midwives include certification by the American College of Nurse-Midwives and graduation from a program approved by that body. Reportedly, the Board plans to eliminate this requirement.

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[4] The AB 1503 program has encouraged the development of expanded roles for nurses, e.g., permitting an R.N. to handle normal deliveries and to prescribe, dispense, and administer drugs or devices, under the general supervision of a licensed physician—without the physician necessarily being present. This experimental manpower program is generally regarded as a valuable tool in developing new, cost-effective ways of delivering primary health care in California, but there appear to be problems in integrating expanded-role health professionals into the regular channels of licensure and practice of the existing health-care establishment after the experimental period under AB 1503.

Since no certification as nurse practitioner has been provided in the State's licensing procedures, a nurse, without violating any law, could have added that designation after his or her name regardless of training. The Board of Registered Nursing, in response to the legislation cited above, has recently developed guidelines for the designation of nurse practitioners which deal with this situation. These guidelines provide for standards for the education of those who wish to hold themselves out to the public as nurse practitioners and to use the initials "NP" as part of their professional designation. The guidelines, in response to the limited authorization in the law, make no attempt to delineate further the scope of practice, the legal status of nurse practitioners, or the educational level of the training programs leading to that designation. Neither do they provide for the licensing of such personnel.

Thus, the Postsecondary Education Commission concludes that the nurse practitioner is a singularly ambiguous health profession, limited by the same ambiguities which surround the entire field of nursing (as discussed in the next chapter). These limits have contributed to preventing the field from realizing the bright promise it once offered for low-cost primary health care.

EDUCATIONAL OPPORTUNITY

In addition to reporting the enrollments and outputs in medicine, the Commission believes that it is essential to report also on educational opportunity—the chances that California citizens have to attend medical school.

Educational opportunity is, of course, a relative concept. Before making any comparisons which suggest how adequate such opportunity is in California, it may be useful to look at absolute numbers to determine how many Californians are entering medical school today.[5] Table M-9 displays this information for three recent years.

It is worth noting that out-of-state institutions provide a sizable portion of the total opportunity for medical education for Californians, and that their enrollment of Californians is growing considerably faster than the enrollment in California medical schools, public or private. Furthermore, public medical schools in California provide less than half of the total medical school admissions provided to Californians each year. In 1976-77, a total of 1,203 Californians were admitted to medical schools, with admissions distributed as follows: University of California, 42.4 percent; private California medical schools, 19.3 percent; public out-of-state medical schools, 8.0 percent; private out-of-state medical schools, 30.3 percent.

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[5] It is impossible to make similar comparisons on opportunities for mid-level practitioners because of the lack of appropriate data.

TABLE M-9

Number of California Students Entering Medical School

	In California			In Other States			
	Public Medical Schools	Private Medical Schools	Total in California Schools	Public Medical Schools	Private Medical Schools	Total in Out-of-State Schools	Total
1973-74	464	203	667	72	262	334	1,001
1974-75	NA	NA	NA	NA	NA	NA	NA
1975-76	493	273	766	64	334	398	1,164
1976-77	510	232	742	96	365	461	1,203

Source: JAMA Annual Medical Education Issues.

Table M-9 contains no data on the number of Californians admitted to foreign medical schools; reliable data on this aspect of admissions are singularly unavailable. The AAMC/AMA collects data only on Canadian medical schools. Information on Californians in foreign schools elsewhere is virtually nonexistent, but Mexico is thought to be the location of the largest number of Californians studying medicine abroad. The parents' association for students at the Universidad Autonoma De Guadalajara estimates that perhaps five hundred Californians are enrolled in that medical school, and the student newsletter at that institution speaks of "over 100 California residents" graduating each year. It would be interesting to know how accurate these figures are, and what percentage they represent of the total of all Californians at foreign medical schools.

In addition to knowing where Californians go for medical training, it is useful to know how the admission practices of California's own medical schools have affected the composition of their entering classes. Table M-10 shows the distribution in recent years of successful applicants from California and from out of state.

In the 1976 entering classes at the University of California's five medical schools, 90.7 percent of the students were Californians, although in recent years the ratio of Californians in the entering classes has dropped, on one occasion, below 80 percent in two of those schools. Both Stanford University and Loma Linda University admit considerably fewer Californians than does the University of California, but five out of six medical students admitted to the University of Southern California are Californians.

Returning to the subject of educational opportunity, a number of measures can be utilized to indicate the adequacy of such opportunity.

By some measures, California appears to be doing a reasonably good job, at least at the median level of all states, of providing educational opportunity for those citizens who wish to attend medical school; other measures suggest just the opposite.

TABLE M-10

Californians in Entering Class of Medical Schools

Medical School	Year	Total Size of Entering Class	Californians in Entering Class	Ratio of Californians in Entering Class
UCD				
	1973	100	96	96.0%
	1974	NA	NA	NA
	1975	101	99	98.0
	1976	96	91	94.8
UCI				
	1973	70	65	92.9
	1974	NA	NA	NA
	1975	69	66	95.7
	1976	65	64	98.5
UCLA				
	1973	145	128	88.3
	1974	NA	NA	NA
	1975	145	136	93.8
	1976	146	132	90.4
UCSD				
	1973	64	42	65.6
	1974	NA	NA	NA
	1975	95	76	80.0
	1976	96	82	85.4
UCSF				
	1973	146	133	91.1
	1974	NA	NA	NA
	1975	146	116	79.5
	1976	159	141	88.7
LOMA LINDA				
	1973	158	74	46.8
	1974	NA	NA	NA
	1975	165	116	70.3
	1976	165	76	46.0
STANFORD				
	1973	90	34	37.8
	1974	NA	NA	NA
	1975	88	44	50.0
	1976	87	43	49.4
USC				
	1973	120	95	79.2
	1974	NA	NA	NA
	1975	136	113	83.1
	1976	136	113	83.1

Source: JAMA Annual Medical Education Issues.

Table M-11, on the following page, depicts California as an average state in terms of the number of its citizens who are admitted to medical school.

TABLE M-11

California's Ranking Among All States by Number of Entering Medical Students

	per 100,000 population	per 1,000 bachelor's degrees awarded in state
1973-74	39th	30th
1974-75	26th	27th
1975-76	23rd	24th
1976-77	27th	27th

Source: Association of American Medical Colleges.

However, if educational opportunity is measured by the number of students accepted compared to the number who applied to medical school, California is no longer an "average" state, but drops to the lower end of the list of states. Table M-12 shows state ranking based on the ratio of residents admitted to medical school for 1975-76 compared to the number of those who applied.

TABLE M-12

Ranking of States by Acceptance of Applicants into Medical School, 1975-76

Rank	State	Rank	State	Rank	State
1	South Dakota	21	Virginia	42	District of Columbia
2	Wyoming	22	Tennessee	43	Missouri
3	North Dakota	23	Minnesota	44	Connecticut
4	Idaho	24	Montana	45	Florida
5	Alaska	25	Oklahoma	46	CALIFORNIA
6	Iowa	26	Nebraska		Utah
7	Kansas	27	Washington	48	New Jersey
8	Louisiana	28	Maine	49	New Mexico
9	Illinois	29	New York	50	Arizona
10	Delaware		Ohio	51	Puerto Rico
11	Alabama	31	North Carolina	52	New Hampshire
12	Mississippi	32	West Virginia		
13	Kentucky	33	South Carolina		
	Wisconsin	34	Pennsylvania		
15	Arkansas	35	Massachusetts		
	Georgia	36	Rhode Island		
17	Vermont	37	Maryland		
18	Nevada	38	Oregon		
19	Indiana	39	Colorado		
20	Texas		Hawaii		
			Michigan		

Source: Association of American Medical Colleges.

A more complete state comparison based on this measure of educational opportunity appears in Table M-13. In this table, the medical school acceptance rates of various states are evident, ranging from 57.4

percent of South Dakota applicants admitted to medical school to 22.0 percent of New Hampshire applicants who were admitted. California has a ratio of 30.3 percent, placing it in a tie for forty-sixth among the states. California's 30.3 percent acceptance rate may appear to be relatively high, given the traditional difficulty in being accepted to medical school. However, when one considers that today's average applicant applies to eight different medical schools, and when one considers how many people are discouraged by the odds and simply do not become applicants, an acceptance ratio of three out of ten well-qualified candidates is not high.

Another view of educational opportunity may be seen from the perspective of the institution, rather than from that of the applicant. While Table M-13 focused on the applicant from each state and his or her chances of being admitted to a medical school somewhere, Table M-14 indicates the ratio of applications to admissions for each medical school in the United States. The reader should keep in mind the distinction between the number of applicants and the number of applications received, since many students apply for admission to a number of medical schools at the same time. Nevertheless, the number of applicants shown for a given institution does represent the pool from which its medical students are selected. The entire table is reproduced here for comparative purposes; California medical schools appear on the first page.

It may appear from an interstate comparison of the number of applicants medical schools receive (Table M-14) that California students do not have to compete much more intensely for admission to their State's medical schools than do students from many other states. California's schools admit about 2.8 percent of their applicants, which is about the same as Missouri (2.6%), Nebraska (2.8%), and New York (2.8%) and is only slightly less than Illinois (3.1%), Massachusetts (3.2%) and Ohio (4.3%). It is also apparent, however, that in many states the medical schools receive far fewer applications than do the California schools. Thus, the situation is confusing; it is still difficult to visualize just what educational opportunity means for the California applicant trying to gain admission to medical school.

A study conducted by the Rand Corporation in 1978 illustrates the effect of where an applicant lives on his or her chances of getting into medical school. Under a grant from the Health Resources Administration of the Department of Health, Education, and Welfare, the Rand Corporation developed a predictive model to determine the effect of state of residence on medical school admissions.

The Rand study had several significant characteristics. First, the study held the ability of the applicant constant in making its comparisons. Where other studies show the ratio of those who apply to medical school to those who are admitted, without regard to the

TABLE M-13

Applicants and Applications by Acceptance Category, Place of Residence, and Sex, 1975-76 First-Year Class

Place of Residence	Rank by Percent Accepted	Applicants Receiving One or More Acceptances				Applicants Not Accepted			Total	
		No. of Men	No. of Women	Total*	Percent Accepted	No. of Men	No. of Women	Total*	No. of Applicants*	No. of Applications*
Alabama	11	197	45	242	43.8	261	49	310	552	2,572
Alaska	5	11	4	15	45.5	14	4	18	33	255
Arizona	50	81	37	118	28.1	245	57	302	420	3,312
Arkansas	15.5	112	31	143	41.8	155	44	199	342	1,028
California	46.5	925	304	1,229	30.3	2,135	684	2,824	4,053	53,160
Colorado	39.5	126	44	170	33.1	270	73	344	514	3,811
Connecticut	44	159	49	208	32.3	318	118	436	644	7,855
Delaware	10	32	8	40	44.0	38	13	51	91	745
District of Columbia	42	29	31	60	32.8	65	58	123	183	1,440
Florida	45	333	78	411	31.7	728	156	885	1,296	9,990
Georgia	15.5	214	66	280	41.8	326	64	390	670	3,639
Hawaii	39.5	53	26	79	33.1	127	33	160	239	1,489
Idaho	4	33	4	37	47.4	36	5	41	78	735
Illinois	9	721	237	958	44.7	918	263	1,184	2,142	18,237
Indiana	19	271	62	333	39.8	405	99	504	837	4,541
Iowa	6	166	33	200	45.4	184	57	241	441	2,133
Kansas	7	173	28	201	45.3	205	38	243	444	1,987
Kentucky	13.5	184	54	238	42.6	248	73	321	559	2,218
Louisiana	8	279	82	361	45.2	362	74	437	798	3,217
Maine	28	21	11	32	37.2	41	13	54	86	858
Maryland	37	242	91	333	34.7	470	156	626	959	7,769
Massachusetts	35	288	99	388	34.9	500	224	724	1,112	12,816
Michigan	39.5	458	164	623	33.1	981	277	1,260	1,883	12,836
Minnesota	23	286	78	364	38.6	457	123	580	944	5,627
Mississippi	12	130	33	163	43.1	173	42	215	378	1,310
Missouri	43	183	43	226	32.5	392	77	470	696	4,637
Montana	24	36	5	41	38.0	58	9	67	108	1,033
Nebraska	26	159	36	195	37.5	274	51	325	520	2,064
Nevada	18	38	9	47	39.8	57	14	71	118	663
New Hampshire	52	9	4	13	22.0	33	12	46	59	550
New Jersey	48	352	118	470	29.3	876	256	1,135	1,605	18,157

TABLE M-13 (continued)

Place of Residence	Rank by Percent Accepted	Applicants Receiving One or More Acceptances				Applicants Not Accepted			Total	
		No. of Men	No. of Women	Total*	Percent Accepted	No. of Men	No. of Women	Total*	No. of Applicants*	No. of Applications*
New Mexico	49	66	15	81	28.4	143	60	204	285	1,279
New York	29.5	1,363	572	1,935	37.0	2,440	851	3,293	5,228	80,869
North Carolina	31	201	54	255	36.1	350	101	451	706	4,200
North Dakota	3	64	9	73	50.3	56	15	72	145	454
Ohio	29.5	512	148	660	37.2	897	217	1,115	1,775	13,853
Oklahoma	25	168	28	196	37.8	273	49	322	518	2,543
Oregon	38	108	28	136	34.0	206	57	264	400	2,909
Pennsylvania	34	752	256	1,008	35.5	1,409	419	1,828	2,836	25,115
Puerto Rico	51	89	45	134	27.5	228	121	353	487	1,364
Rhode Island	36	32	8	40	34.8	57	18	75	115	1,384
South Carolina	33	152	37	189	35.7	281	58	341	530	2,088
South Dakota	1	55	15	70	57.4	46	6	52	122	463
Tennessee	22	220	49	269	38.9	343	79	423	692	2,129
Texas	20	623	165	788	39.6	976	227	1,204	1,992	13,217
Utah	46.5	95	13	108	30.3	226	22	248	356	2,465
Vermont	17	41	10	51	41.5	60	12	72	123	806
Virginia	21	252	88	342	39.5	404	119	523	865	5,413
Washington	27	123	56	179	37.4	247	53	300	479	4,069
West Virginia	32	72	21	93	35.8	137	29	167	260	1,178
Wisconsin	13.5	216	70	286	42.6	293	92	385	671	4,254
Wyoming	2	24	4	28	50.9	22	5	27	55	484
Foreign†		54	18	72	14.3	346	85	433	505	4,341
Unidentified		33	12	147	44.3	93	21	185	332	344
U.S. territories and possessions‡		3	4	7	31.8	11	4	15	22	135
Total		11,619	3,639	15,365	36.3	20,896	5,936	26,938	42,303	366,040

* Data include 107 accepted and 106 unaccepted applicants for whom gender information was unavailable.

† Since data in this table are presented by place of residence rather than by citizenship, the total of 505 foreign applicants includes only those specifying a foreign country as their place of legal residence.

‡ U.S. territories and possessions other than Puerto Rico.

TABLE M-14

Applicants and New Entrants by Medical School and Sex, 1975-76 First-Year Class

Name of School* (by State or Territory)	No. of New Entrants to First-Year Class†			Total No. of Applicants†		
	Men	Women	Total	Men	Women	Total
Alabama						
* Alabama – Birmingham	113	32	145	819	172	992
* South Alabama	58	6	64	857	166	1,023
Arizona						
* Arizona	48	32	80	562	138	700
Arkansas						
* Arkansas	94	28	122	522	125	647
California						
* California – Davis	71	29	100	2,792	959	3,754
* California – Irvine	57	13	70	2,695	817	3,513
* California – Los Angeles	105	39	144	2,980	957	3,938
* California – San Diego	83	12	95	3,125	1,006	4,132
* California – San Francisco	94	60	154	3,399	1,179	4,578
Loma Linda	123	40	163 ‡	4,032	853	4,888
Southern California	117	19	136	3,297	939	4,237
Stanford	59	26	85	3,505	1,156	4,663
Colorado						
* Colorado	95	30	125	1,279	362	1,642
Connecticut						
* Connecticut	56	24	80	1,217	526	1,744
Yale	74	28	102	1,879	742	2,623
District of Columbia						
George Washington	106	44	150	7,538	2,186	9,728
Georgetown	165	40	205	7,247	2,070	9,322
Howard	85	38	123	3,583	1,087	4,674
Florida						
* Florida (includes Florida State – Florida A & M)	94	23	118	1,792	461	2,257
Miami	108	22	130	1,065	239	1,310
* South Florida	63	11	74	776	167	944
Georgia						
Emory	80	31	111	3,820	906	4,728
* Med. Coll. Georgia	138	42	180	1,127	255	1,382
Hawaii						
* Hawaii	45	21	66	2,524	518	3,043
Illinois						
Chicago Medical	80	30	110	5,578	1,397	6,978
Chicago – Pritzker	86	18	104	5,414	1,519	6,937
* Illinois	267	78	345	1,956	578	2,536
Loyola (Stritch)	99	31	130	4,563	1,474	6,042

* Asterisks identify schools that are publicly controlled.

† Totals include 104 new entrants and 343 applicants for whom gender information was unavailable.

‡ Loma Linda and Tennessee each admitted two entering classes.

§ For 1975-76, Missouri – Kansas City selected for Year 1 of their six-year program, 71 of 455 high school graduates applying. The data given in table are for Year 3 of the program (equivalent to the freshman year at other medical schools) and include only these students promoted from Year 2 plus five students transferring into the program at the Year 3 level.

** Total figures under applicants actually refer to applications.

TABLE M-14 (continued)

Name of School* (by State or Territory)	No. of New Entrants to First-Year Class†			Total No. of Applicants†		
	Men	Women	Total	Men	Women	Total
Northwestern	129	42	171	5,277	1,439	6,721
Rush	79	33	112	2,494	890	3,386
* Southern Illinois	59	9	68	997	242	1,240
Indiana						
* Indiana	254	51	305	1,435	339	1,775
Iowa						
* Iowa	142	33	176	739	200	940
Kansas						
* Kansas	175	28	203	893	192	1,085
Kentucky						
* Kentucky	83	25	108	1,286	375	1,663
* Louisville	106	30	136	1,028	249	1,278
Louisiana						
* Louisiana State—New Orleans	137	38	175	906	207	1,114
* Louisiana State—Shreveport	80	16	96	604	120	725
Tulane	116	32	148	6,118	1,346	7,466
Maryland						
Johns Hopkins	75	16	120	2,144	713	2,887
* Maryland	126	41	167	1,215	426	1,642
Massachusetts						
Boston	91	42	134	3,198	1,226	4,425
Harvard	105	59	165	2,265	911	3,177
* Massachusetts	75	24	99	1,131	413	1,544
Tufts	97	49	146	5,992	1,953	7,948
Michigan						
* Michigan	169	67	237	3,130	929	4,061
* Michigan State	64	39	103	1,941	637	2,581
* Wayne State	200	56	256	2,987	715	3,704
Minnesota						
Mayo	30	10	40	1,238	364	1,604
* Minnesota—Duluth	31	4	35	724	152	876
* Minnesota—Minneapolis	196	46	242	1,664	401	2,066
Mississippi						
* Mississippi	121	28	149	584	112	696
Missouri						
* Missouri—Columbia	85	26	111	1,250	250	1,501
* Missouri—Kansas City	3	2	62	5	2	65‡
St. Louis	131	24	155	7,361	1,666	9,030
Washington—St. Louis	94	26	120	4,917	1,468	6,387
Nebraska						
Creighton	98	12	110	6,720	1,353	8,079
* Nebraska	122	23	145	910	243	1,154
Nevada						
* Nevada	39	9	48	559	95	655
New Hampshire						
Dartmouth	47	17	64	1,778	684	2,480
New Jersey						
* New Jersey Med.	81	29	110	1,750	648	2,402
* Rutgers	68	39	107	1,724	628	2,356

TABLE M-14 (continued)

Name of School* (by State or Territory)	No. of New Entrants to First-Year Class†			Total No. of Applicants†		
	Men	Women	Total	Men	Women	Total
New Mexico						
* New Mexico	59	14	73	922	239	1,164
New York						
Albany	82	27	109	3,292	1,009	4,303
Albert Einstein	126	52	178	4,795	1,559	6,355
Columbia	97	50	147	3,646	1,407	5,055
Cornell	74	27	101	6,388	2,230	8,619
Mount Sinai	63	18	81	2,818	1,129	3,948
New York Med.	120	51	171	3,353	1,244	4,604
New York Univ.	120	51	171	3,191	1,300	4,492
Rochester	69	26	97	3,156	1,106	4,266
* State Univ. New York—Buffalo	94	41	135	3,669	1,279	4,949
* State Univ. New York—Downstate	161	55	216	3,918	1,405	5,324
* State Univ. New York—Stony Brook	23	23	49	1,725	768	2,497
* State Univ. New York—Upstate	84	36	120	3,306	1,137	4,444
North Carolina						
Bowman Gray	76	22	98	3,324	751	4,076
Duke	80	34	114	3,378	1,006	4,385
* North Carolina	109	31	140	1,282	396	1,678
North Dakota						
* North Dakota	56	12	68	157	30	188
Ohio						
Case Western Reserve	98	40	138	3,936	1,236	5,174
* Cincinnati	148	44	192	4,668	1,210	5,880
* Med. Coll. Ohio—Toledo	70	26	96	1,538	385	1,924
* Ohio State	186	41	227	1,850	490	2,341
Oklahoma						
* Oklahoma	145	22	167	1,069	178	1,247
Oregon						
* Oregon	91	24	115	682	167	850
Pennsylvania						
Hahnemann	137	34	171	3,897	1,323	5,220
Jefferson	177	46	223	4,137	1,165	5,302
Med. Coll. Pennsylvania	39	66	105	2,534	2,161	4,696
Pennsylvania	116	44	160	3,670	1,239	4,912
Pennsylvania State	77	24	102	1,900	622	2,523
Pittsburgh	102	35	137	3,002	827	3,830
Temple	144	36	180	3,870	1,204	5,075
Rhode Island						
Brown	42	19	61	146	42	188
South Carolina						
* South Carolina	137	28	165	1,065	202	1,268
South Dakota						
* South Dakota	50	15	65	523	92	617

TABLE M-14 (continued)

Name of School* (by State or Territory)	No. of New Entrants to First-Year Class†			Total No. of Applicants†		
	Men	Women	Total	Men	Women	Total
Tennessee						
Meharry	82	27	113	2,366	652	3,072
* Tennessee	172	32	204 ‡	419	100	519
Vanderbilt	64	19	83	4,244	1,183	5,428
Texas						
Baylor	130	38	168	2,759	746	3,505
* Texas—Galveston	158	45	203	1,930	448	2,379
* Texas—Houston	47	16	64	1,848	442	2,292
* Texas—San Antonio	97	31	128	1,848	452	2,301
* Texas—Southwestern	169	33	202	1,969	467	2,437
* Texas Tech.	34	6	40	1,101	229	1,330
Utah						
* Utah	87	13	100	1,224	244	1,468
Vermont						
* Vermont	64	18	82	1,808	550	2,358
Virginia						
Eastern Virginia	34	14	48	1,142	277	1,420
* Med. Coll. Virginia	132	35	169	2,632	747	3,381
* Virginia	104	30	134	2,513	717	3,234
Washington						
* Washington	125	50	175	1,226	343	1,570
West Virginia						
* West Virginia	67	17	84	372	87	460
Wisconsin						
Med. Coll. Wisconsin	97	24	121	3,058	725	3,785
* Wisconsin	123	33	156	1,130	337	1,467
Puerto Rico						
* Puerto Rico	85	45	130	381	187	572
All Schools**	11,294	3,512	14,910	281,684	84,013	366,040
Subtotals by Control						
Private (N = 48)	4,520	1,553	6,111	179,025	54,724	233,953
Public (N = 66)	6,774	1,959	8,799	102,659	29,289	132,087

Source: *Journal of Medical Education*.

quality of the applicant, the Rand data show this comparison for students of equal ability (as measured by GPA, MCAT scores, etc.).[6] Second, the study utilized a series of demographic parameters for each state: physician population, per capita income, medical school spaces per bachelor's degrees awarded, per capita expenditure on medical education, existence of interstate compacts, etc. Third, the study ran separate computations for majority and minority students, with Asian students, who are generally well represented in medical education, defined as majority students.

For each state the Rand study developed a discrimination coefficient which reflected the impact of the demographic variables on medical school admissions. Using regression analysis, the study developed an average probability of admission for an applicant in each state, and the probability of admission of a "good" applicant in each state. Rankings of admission probability were made for both majority and minority students. The results for 1974, the most recent year of data, appear in Tables M-15a/b. California ranks last among fifty-three states and territories in admission probability for majority students (Table M-15a), and forty-fourth for minority students (Table M-15b)—a dramatic commentary on educational opportunity in California.

California's rankings in this predictive model, disappointing as they may be, are not surprising. The Rand Corporation identified two factors that improve the chances for residents of a state being admitted to medical school: (1) the fewer physicians a state has, and (2) the more medical school places a state has in relation to its population. California has a large number of physicians, which makes the first factor inoperative. On the other, it does rank low in the number of medical school places per population. Only three states with medical schools have fewer first-year places per population than California. Two of the three, Florida and Arizona, are "Sunbelt" states with heavy in-migration of physicians similar to that of California. The third, New Jersey, has long been recognized as the greater exporter of students in higher education to other states because of the slowness of development of its higher education system.

Even though two new public medical schools were opened in California in the 1960s, the State may have done too little too late in keeping

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6. Medical school applicants do vary in quality from state to state. The John Wong Report observes that students denied admission by California medical schools in 1975-76 had average MCAT science scores surpassed only by the nonaccepted students of one other state, Washington. The mean science score (577) for the California rejectees was greater than the mean science score for more than 1,200 resident acceptees from South Carolina, North Dakota, North Carolina, Mississippi, Louisiana, and Alabama.

TABLE M-15a

Effect of Majority Applicants' State of Residence for 1974

State	Rank	Discriminant Coefficient	Multiplicative Factor	Average Probability of Admission	Probability of Admission of Good Applicant
North Dakota	1	1.492	4.446	0.692	0.917
Nevada	2	1.453	4.277	0.683	0.914
South Carolina	3	1.382	3.982	0.668	0.908
South Dakota	4	1.318	3.735	0.653	0.903
Mississippi	5	1.216	3.374	0.630	0.896
Alabama	6	1.179	3.252	0.621	0.890
Arkansas	7	1.068	2.911	0.595	0.879
Louisiana	8	1.054	2.869	0.591	0.877
Tennessee	9	1.008	2.740	0.580	0.872
Kentucky	10	0.891	2.438	0.551	0.858
Georgia	11	0.885	2.423	0.550	0.858
Puerto Rico*	12	0.837	2.310	0.538	0.852
Virginia	13	0.728	2.072	0.511	0.837
- - -					
Nebraska	14	0.615	1.850	0.483	0.821
Kansas	15	0.501	1.650	0.454	0.804
West Virginia	16	0.434	1.375	0.443	0.797
Texas	17	0.400	1.492	0.429	0.788
Wyoming	18	0.376	1.434	0.423	0.783
Oklahoma	19	0.258	1.294	0.393	0.763
Indiana	20	0.214	1.239	0.385	0.755
North Carolina	21	0.174	1.190	0.375	0.747
Minnesota	22	0.112	1.119	0.361	0.738
Iowa	23	0.042	1.042	0.345	0.722
Vermont	24	0.040	1.041	0.344	0.721
- - -					
Ohio	25	-0.074	0.928	0.319	0.698
Missouri	26	-0.103	0.902	0.313	0.692
Illinois	27	-0.115	0.891	0.310	0.689
Hawaii	28	-0.152	0.859	0.302	0.681
Florida	29	-0.179	0.836	0.297	0.675
Pennsylvania	30	-0.234	0.791	0.285	0.663
Maryland	31	-0.252	0.777	0.282	0.659
Alaska	32	-0.257	0.773	0.281	0.658
Maine	33	-0.338	0.713	0.265	0.639
Montana	34	-0.360	0.698	0.260	0.634
Oregon	35	-0.487	0.615	0.237	0.605
Delaware	36	-0.502	0.605	0.234	0.601
Rhode Island	37	-0.502	0.605	0.234	0.601
New Mexico	38	-0.512	0.600	0.232	0.599
District of Columbia	39	-0.524	0.592	0.230	0.596
Michigan	40	-0.534	0.586	0.228	0.593
Wisconsin	41	-0.541	0.582	0.227	0.591
Idaho	42	-0.573	0.563	0.221	0.583
New York	43	-0.661	0.516	0.207	0.562
Utah	44	-0.693	0.500	0.201	0.556
- - -					
New Jersey	45	-0.712	0.491	0.198	0.550
Colorado	46	-0.720	0.487	0.197	0.548
Connecticut	47	-0.755	0.470	0.192	0.539
Arizona	48	-0.900	0.407	0.170	0.503
New Hampshire	49	-0.902	0.406	0.170	0.502
Massachusetts	50	-0.937	0.392	0.165	0.493
Washington	51	-0.994	0.370	0.157	0.479
California	52	-1.169	0.311	0.135	0.436
Foreign	52	-1.225	0.294	0.129	0.422

*Includes U.S. territories and possessions.

Source: Rand Corporation.

TABLE M-15b

Effect of Minority Applicants' State of Residence for 1974

State	Rank	Discriminant Coefficient	Multiplicative Factor	Average Probability of Admission	Probability of Admission of Good Applicant
South Dakota	1	5.326	205.636	0.994	1.000
New Hampshire	2	3.262	26.098	0.957	0.997
Wyoming	3	3.087	21.905	0.949	0.996
North Dakota	4	2.468	11.804	0.909	0.992
Montana	5	1.756	5.792	0.831	0.984
Oklahoma	6	1.195	3.302	0.737	0.973
Vermont	7	1.042	2.834	0.706	0.969
Wisconsin	8	0.827	2.286	0.660	0.961
New Mexico	9	0.801	2.228	0.654	0.960
Utah	10	0.756	2.130	0.644	0.959
Hawaii	11	0.454	1.575	0.572	0.945
Kansas	12	0.340	1.405	0.564	0.939
North Carolina	13	0.337	1.400	0.563	0.939
Oregon	14	0.146	1.157	0.495	0.927
Idaho	15	0.096	1.101	0.483	0.923
Indiana	16	0.092	1.096	0.482	0.923
Nebraska	17	0.027	1.027	0.464	0.918
Louisiana	18	-0.009	0.991	0.457	0.915
Georgia	19	-0.044	0.957	0.448	0.913
Virginia	20	-0.046	0.955	0.447	0.912
Alabama	21	-0.097	0.908	0.435	0.908
South Carolina	22	-0.114	0.892	0.431	0.907
Ohio	23	-0.160	0.852	0.419	0.903
Texas	24	-0.161	0.851	0.419	0.903
Washington	25	-0.182	0.834	0.414	0.901
Tennessee	26	-0.223	0.800	0.404	0.897
Mississippi	27	-0.241	0.786	0.400	0.896
Pennsylvania	28	-0.291	0.748	0.388	0.891
Minnesota	29	-0.298	0.742	0.386	0.890
Missouri	30	-0.357	0.700	0.372	0.884
Puerto Rico*	31	-0.360	0.698	0.372	0.884
Illinois	32	-0.361	0.697	0.372	0.884
Michigan	33	-0.361	0.697	0.371	0.884
Alaska	34	-0.383	0.682	0.368	0.881
New Jersey	35	-0.394	0.675	0.364	0.880
Kentucky	36	-0.462	0.630	0.348	0.873
Colorado	37	-0.502	0.606	0.339	0.869
Arkansas	38	-0.502	0.605	0.339	0.868
Florida	39	-0.596	0.551	0.319	0.857
Maryland	40	-0.611	0.543	0.315	0.855
New York	41	-0.628	0.534	0.312	0.853
District of Columbia	42	-0.699	0.497	0.297	0.844
Rhode Island	43	-0.826	0.438	0.271	0.827
California	44	-0.827	0.437	0.271	0.827
Massachusetts	45	-0.862	0.422	0.284	0.822
Iowa	46	-0.963	0.382	0.265	0.806
Nevada	47	-0.970	0.379	0.263	0.805
Connecticut	48	-1.023	0.359	0.234	0.797
Arizona	49	-1.091	0.336	0.222	0.786
Maine	50	-1.117	0.327	0.217	0.781
West Virginia	51	-1.269	0.281	0.192	0.754
Foreign	52	-1.441	0.237	0.167	0.721
Delaware	53	-2.460	0.085	0.068	0.482

*Includes U.S. territories and possessions.

Source: Rand Corporation.

up with the demand for medical education. Lulled by the security of having enough doctors, the State did not aggressively protect opportunities for Californians, with the result that in-migration of physicians has supplied and continues to supply 70 percent of the total number of practicing physicians.

With 10.2 percent of the nation's population, California accounted for only 6.4 percent of the admissions into medical school in 1975-76, and awarded only 6.8 percent of all M.D. degrees granted in the United States in 1977. Another interesting comparison is that California had 10.3 percent of the nation's residency positions in 1976-77, but only 6.1 percent of those total positions were occupied by graduates of California medical schools.

SPECIAL CONSIDERATIONS IN PLANNING FOR MEDICAL EDUCATION

Incorporating medical education into a health sciences education plan in future years will require the resolution of several problems. The first of these is the collection of data. An examination of the statistical tables in this present plan shows the large number of sources that had to be drawn from just to obtain data from 1972 to 1977. As a result, any inferences drawn from these data must be regarded as tentative because of their possible noncomparability. This splicing together of sources is necessary because no agency has collected uniform data on medical education for any length of time. Furthermore, comparability suffers as agencies collecting data use secondary and tertiary sources. In the development of this Plan, it has been necessary in some instances to retrieve data from national associations to which California medical schools have reported (and there is generally a time lag before the associations publish the data), because the same data have not been available in similar form in Sacramento, or Berkeley, or at the individual medical school.

Second, there are a number of semantic problems which are encountered in planning, since terms are used by health professionals in inconsistent, confusing, or inaccurate ways. For example, "primary care" means one thing in the John Wong Report (first access into the health care system), and something else in the Health Manpower Plan (continuous surveillance of family health). Similarly, "underserved area" connotes an area in which the inhabitants lack proper medical care, but even in the sophisticated California system of identifying such areas by census tract there is no provision for determining what medical care exists in an area other than through the four primary-care specialties, and no provision for identifying other modes of health care delivery which may be available. Other ambiguities occur in the phrase, "culturally sensitive health services," used in the Health Manpower Plan, a phrase whose meaning was never agreed upon during the consultation and review process in the development of this chapter on medicine.

The third problem arises from the dominance of the private medical establishment—the various associations of practitioners and educators—over medical education. To a degree not possible in any other professional discipline, these national associations control every aspect of medical education and postgraduate medical education—curriculum, licensure, accreditation, etc. In its present form, this control is so pervasive that it precludes the State of California from planning and implementing any nontraditional form of medical education or medical licensure, which might be desirable in addressing such problems as educational opportunity, geographical or specialty maldistribution, etc.

These and other problems make the task of planning for medical education particularly challenging.

FINDINGS

The Commission makes the following findings in matters affecting public policy.

- The current enrollment and output of California medical schools are adequate to meet the State's needs in the immediate future (as identified in the Health Manpower Plan) *if* the present inmigration of physicians continues.
- California residents have the least chance for admission to medical school of residents of any state when comparing equally qualified applicants.
- While California has 10.1 percent of the nation's population, it has only 6.4 percent of the first-year medical school places in the country. However, California has 10.3 percent of the total residency positions, indicating that postgraduate medical education has been allowed by the State to grow to a considerably larger size than has medical education.
- If public policy requires that the mix of California's supply of new physicians be modified, influencing the output of residencies may be more effective than influencing the output of medical schools, inasmuch as there are three-and-one-half times as many people finishing residencies each year in California than there are finishing medical school. However, such influence may not be easy to establish since the State in the past has exercised considerably less direct control over graduate medical education than it has over medical education. Also, such efforts will have no effect on the mix of physicians coming into the State with their specialties already established.

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- The existence of residencies in a given specialty and location may be the result of a complex interaction of factors. Furthermore, such residencies may provide health care, research, and other socially desirable services, as well as graduate medical education.

- State agencies exercise relatively little control over the mix of residencies by specialty within the University of California, and none over residencies in private medical schools, although Song-Brown Act funds provide incentives to establish family practice residencies.

- During the past five years, the University of California has increased the number of its residencies at twice the rate it has increased medical school enrollments—45 percent vs. 22.4 percent.

- The mid-level fields of physician's assistant and, particularly, nurse practitioner suffer from lack of clear identity as mid-level fields of practice in medicine, producing a corresponding lack of clear delineation as educational programs.

- State agencies exercise relatively little authority in collecting data on public medical education in California; large amounts of useful data flow from institutions to the American Medical Association and the Association of American Medical Colleges without being transmitted to Berkeley and/or Sacramento.

- Inadequate attention has been devoted to the status of women in the health fields by the Department of Health in its Health Manpower Plan.

What is the significance of these findings to California's educational policy makers? Before this question can be examined, it will be useful to restate the basic findings of the Health Manpower Plan relative to the adequacy of health care in California:

1) The overall number of physicians in California is adequate.

2) There is a geographical maldistribtuion of physicians which leaves certain areas without adequate medical care—particularly remote rural areas and some low-income, inner-city areas which include minority populations.

3) There is a maldistribution of specialties among physicians, with too many in narrow specialties and not enough in primary-care specialties.

4) There are an insufficient number of minority physicians who can provide linguistic and culturally sensitive health services to the 25 percent of the State's people who are underrepresented in the health professions.

The Department of Health's strategies for the resolution of the four problems it has identified in California medical care comes in the form of ten recommendations. For each of these recommendations the Commission has identified certain issues, based on the findings in its own Health Sciences Education Plan and its reading of the Health Manpower Plan. These issues include philosophical, fiscal, and practical concerns in the implementation of these recommendations and, in some cases, even concerns over the wisdom of the recommendation itself. Lest it be accused of negativism, the Commission points out that it is simply identifying some of the complexities underlying the recommendations—the complexities which have kept the rich State of California not only from attaining adequate medical care for all of its citizens, but also providing adequate opportunities for its citizens to pursue medical careers.

Issues Raised By Findings of Health Sciences Education Plan Vis-A-Vis Findings of Health Manpower Plan

Recommendations from Health Manpower Plan	Issues Raised in Preparing Health Sciences Education Plan
1. *No action should be taken at this time to increase the overall supply of physicians in California.*	While the Commission is persuaded by the evidence furnished by the Department of Health that the total number of physicians in California is more than adequate, it is equally persuaded by its own evidence that educational opportunity in the field of medicine is not adequate. In attempting to balance the needs of the market place for trained manpower against the demands of students for educational programs, the Commission can rarely expect the balance to be either perfectly or permanently achieved. In the case of medical education, the issue becomes: should California's last-place standing among the states justify stepping up the training of physicians in the face of such a large and growing physician population.

Recommendations from Health Manpower Plan	Issues Raised in Preparing Health Sciences Education Plan
2. *The State should continue existing mechanisms and explore other strategies to influence the location of primary-care physicians and non-physician medical practitioners in urban and rural geographic areas.*	Free choice has been characteristic of California's higher education system, although not every person choosing to enter medical school has been able to do so. Free choice has also been characteristic of the siting of practices by physicians, as witnessed by the two-thirds of California's current physician population which have come here from out of state. Physicians are no different than other people in wanting to locate in communities of their own choice. To persuade them to settle elsewhere may require strategies and incentives beyond those presently utilized, or it may require new public policy. This is a complex philosophical issue.
3. *The State should increase its encouragement of primary-care, residence-training programs located in rural physician shortage areas, and should support the recruitment and admission of persons with rural backgrounds into medical school.*	There may be a problem in decentralizing residency training to a greater degree, inasmuch as residencies require a clinical population of adequate size and proper supervision.
4. *The State should provide more active support for programs that promote the preparation, acceptance, and training in medical school and other health professional schools of increased numbers of persons from minority backgrounds who will have a high likelihood of practicing in minority health manpower shortage areas.*	The rationale for the Department of Health's recommendation for additional minority students in medical schools is their "high likelihood of practicing in minority health manpower shortage areas." In the absence of definitive studies showing the relationship of place of origin to place of practice in all settings, particularly in the inner city, it would be wise to call for increased minority enrollment in medical schools primarily as a means of providing greater opportunity for groups which have been underrepresented in the medical profession, and to provide greater diversity within the profession.

Recommendations from Health Manpower Plan	Issues Raised in Preparing Health Sciences Education Plan
5. *As an overall State goal within five years, 50 percent of physicians entering practice in California should be in the primary-care specialties: family/general practice, general internal medicine, general pediatrics, and obstetrics/gynecology.*	At present, choice of specialty is left to the graduate M.D., and the arrangements he or she can make with an existing residency program, through a national system which matches students and programs. If the student's choice is regarded as an educational choice, the State may wish to say, as it does to many students applying to medical school, that there is no room for them in the field, but that they are free to pursue other choices. The State would have to assume much more control over residencies--in the name of educational coordination--than it presently exercises, and there would still be no direct control over the mix of those physicians entering California from other states and foreign countries.
6. *The Department of Health, the Postsecondary Education Commission, and the training institutions should collaborate on research for further evaluation of the numbers needed, quality of care provided, public acceptabilty, and costs/benefits of training and utilizing physician's assistants and nurse practitioners in California.*	From the Commission's point of view, only one of the enumerated research factors is under the direct purview of educators: costs. While the other factors are of interest to the educator, information on how these factors operate in practice is rarely available through educational information systems.
7. *Pending additional research findings, the State should continue to support and encourage the expansion and development of training programs for primary-care physician's assistants in sufficient numbers so that the positive contribution to health care services they have already demonstrated can be fully explored.*	An expansion of the program because of its "positive contribution to health care services," carried out simultaneously with a study to determine the value of that program, seems somewhat premature and tends to prejudge the results of the evaluation.

Recommendations from Health Manpower Plan	Issues Raised in Preparing Health Sciences Education Plan
8. *State policy should promote the optimum use of the skills and knowledge of those non-U.S. citizens who are foreign medical graduates now residing in California who intend to remain here. Where the potential exists, they should be given assistance in preparing for satisfactory completion of licensure requirements.*	The establishment of mechanisms for accomplishing this goal would require additional funding, and would further contribute to the large number of physicians in California who have been trained elsewhere. Also, even though the flow of non-citizen, foreign graduates is drying up because of federal action, it may be discriminatory to assist such persons to become licensed while reducing the opportunity of foreign graduates who are citizens of California to become licensed. (See issue #9.)
9. *So that the abilities of those United States citizens already trained or currently being trained in foreign medical schools can be utilized, "Fifth Pathway" and other possible avenues to medical licensure in California for them should be fully implemented. However, it should be recognized that, for the future, medical education institutions within the United States should be adequate to supply new physicians for California, and new enrollments of United States citizens in foreign medical schools should not be encouraged by public policy. Therefore, Fifth Pathway programs should be continued only through June 1981.*	Fifth Pathway[7] is the only practical route for many U.S. citizens studying abroad to enter the medical profession in the United States. Third and Fourth Pathways are "Catch 22" situations in that, if a person had acquired an American medical license, he or she would have already had education equivalent to that provided through the Pathway, and thus would not need admission to American medical education as a means of entering the profession. The First Pathway is subject to the very limited number of third- and fourth-year transfer spaces available in California medical schools. Thus, for the typical student at Guadalajara, only Second and Fifth Pathways are possibilities. The elimination of the latter would mean that California would play no direct or supportive role in the admission

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[7] The Fifth Pathway program in California is funded through a $500,000 item in the budget of the Student Aid Commission. Fifty students per year receive one-year pre-residency training designed to bring them up to licensure standards and to make them eligible for residency training. Coooperating institutions are UC Irvine, UC Davis, and USC.

Recommendations from Health Manpower Plan	Issues Raised in Preparing Health Sciences Education Plan
9. *Recommendation 9 continued.*	of these students, deferring instead to a national competency examination, the results of which would determine admission to further training. Also, consideration should perhaps be given to the fact that Fifth Pathway students are functionally bilingual in medical matters, and thus could be utilized to provide health care in underserved areas with non-English-speaking populations.
10. *The State should actively encourage the establishment of preventive-medicine residency programs in California.*	Much of the work of preventive medicine can be carried out by non-physicians: nutritionists, physical education specialists, occupational safety specialists, entomologists in vector control, biological statisticians, et al. To recruit physicians into public health or occupational medicine may be to move away from attention to primary care, and toward the administration of health care.

The Commission reiterates that the discussion above in the right-hand column is simply an indication of the dimensions or complexities of the proposals made by the Department of Health in the left-hand column, and is not intended to represent refutation of or disagreement with any of the proposals.

The other "pathways" into American medical education for foreign medical graduates are: (1) transferring through the Coordinated Transfer Application System (COTRANS) administered by the Association of American Medical Colleges and the National Board of Medical Examiners; (2) admission by examination administered by the Education Commission for Foreign Medical Graduates (ECFMG); (3) obtaining an unrestricted license to practice medicine in one of the states; (4) obtaining licensure, in the case of U.S. citizens, after internship or residency, and achieving eligibility for ECFMG certification.

UTILIZATION OF CLINICAL TRAINING SITES

It is difficult to assess how well medical education utilizes the clinical sites available in California. Most hospitals and clinics are potential training sites; in that sense, there are locations around the State which are not fully utilized for training. However, the need for large clinical populations has generally made it necessary for medical schools and residency programs to seek out large hospitals in urban settings. Here the utilization of clinical facilities is obviously at a much higher level.

Table M-16 displays the distribution of residency programs in various hospitals around the State, as reported by the Liaison Committee on Graduate Medical Education (LCGME) in 1977. This table shows the extent to which clinical facilities for postgraduate medical education are becoming decentralized. By comparing the 1977 distribution of residencies to that reported earlier by the LCGME, one can detect trends in the utilization of clinical sites. For example, residencies are being operated in smaller and more remote communities than previously. This is particularly true in family practice, in which communities such as Redding, Merced, Salinas, Bakersfield, Davis, Lancaster, and Ventura now have residency programs.

It is also possible to identify the kinds of residencies which are most widely utilized geographically, and the ones which the smaller hospitals find advantageous. Because internal medicine, obstetrics/gynecology, surgery, and various forms of radiology all represent frequently required services in hospitals, it is understandable that a wide variety of hospitals have chosen to develop residencies in these areas.

Table M-16 lists each residency program in California by specialty and by its hospital setting, together with medical school affiliations, where appropriate, and the size of the program. Because of the length of this table, it is included as an appendix to this chapter, rather than appearing at this point, where it might deter the reader from reaching the balance of the text.

RECOMMENDATIONS

The Postsecondary Education Commission has identified several areas in which the circumstances outlined in this chapter on medical education call for specific recommendations.

The Size of the Medical Education Program

The Commission recognizes that any quantitative evaluation of medical education in California, as the measure of adequacy of such education, must focus primarily on how well the health care needs, rather than the educational aspirations, of the people of the State are being met.

Ensuring that Californians have proper health care is a higher State priority than is ensuring that Californians have opportunities to become health professionals, although, ultimately, the one cannot be achieved without the other. Inasmuch as there are high and escalating costs to general government in providing health care, and high and growing costs to postsecondary education in providing medical education, there simply may not be enough resources available to make more than nominal increases in the number of entering places for Californians in California medical schools.

The Commission has determined that the public interest is best served by taking steps to ensure that the present situation is not exacerbated by the output of additional physician training programs beyond the eight medical schools now in existence and the two-year programs operating at Berkeley, Riverside, and Fresno, and planned at Charles R. Drew. In making the determination the Commission recognizes that educational opportunity for all Californians who are interested in medical school may be limited in the years ahead.

The Commission recommends:

Recommendation 1

Because of the large and growing number of physicians now practicing or receiving graduate medical education in the State, no additional medical schools or sub-campuses of medical schools should be implemented or phased-in in California until the rate of in-migration drops markedly. During this time, existing and currently planned two-year programs should not be expanded beyond two-year status.

The State's Relationship to Residencies

The Commission concludes that medical residencies have been allowed to proliferate in California without planning and coordination. The Commission also concludes that residencies are an important means of correcting problems of geographical and specialty maldistribution, and can be instrumental in providing health care to underserved areas.

If the State decides to exert more influence on the establishment of residencies, it must determine how such influence could best be exerted. There are several alternatives, ranging across a spectrum of State involvement. At one end of this spectrum is minimum State involvement. The status quo is not far from this end of the spectrum;

residencies, like academic programs, are conceived and developed locally, but ultimately require approval at the State level before State funds can be used to support programs.[8]

At the other end of the spectrum lies State control over residencies. Assemblyman Duffy has twice introduced legislation in recent years which would give the State control over the certification of all residencies in California. Such certification would be given only to programs deemed essential in terms of identified needs for the various medical specialties. Without such State certification, a health facility could not operate graduate medical education programs. While neither of Mr. Duffy's bills passed, they served to focus attention on the State's concern over the present distribution of residency training positions.

Between the laissez faire of the status quo and the control desired by Mr. Duffy lie any number of other possible approaches which could express and implement the State's concerns over graduate medical education. For example, the present procedure for reviewing residencies could be brought more in line with those of the academic review process. The Postsecondary Education Commission could include residencies in the review process, and the Department of Finance could scrutinize the University of California's health science budgets to ensure that any growth or shift in emphasis in residencies was in accordance with some agreed upon plan.

Although it is unlikely that the State could ever take the lead in establishing a particular residency, nevertheless the State can do considerably more than it presently does under traditional review procedures. For this reason, the Commission offers this recommendation.

Recommendation 2

The State should determine the mode and degree of State influence on medical education programs, particularly residencies,

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[8] The decision to begin a residency appears to be made in one of two ways. In a teaching hospital the faculty generally makes the decision, perhaps in order to utilize the special competence of a new faculty member. In an institution with less formal ties to a medical school (e.g., a Veterans Administration or county hospital) the decision to implement a new residency is made by hospital staff, in an effort to improve the quantity or quality of medical care at the institution. Some community hospitals might use both rationales—better health care and better educational programs--in proposing new programs, hoping to provide an extra inducement in recruiting professional staff.

which would achieve the most beneficial results in effecting desired distribution of medical specialties and optimum utilization of medical education as a means of providing health care in underserved areas.

In making this recommendation, the Commission intends that any moves toward its implementation would take place jointly through efforts of the Commission, the Department of Health, the University of California, the private medical schools, the Department of Finance, medical societies, et al.

The Determination of Medical Underservice

In trying to effect a better distribution of health-care services through greater influence on residencies, the State needs to have an accurate picture of the present availability of that care. The methods used by the Department of Health (modified from techniques used by the federal government) of identifying medically underserved areas by counting the primary-care physicians in a given census tract is not a complete measure of health care, particularly in urban settings. Such a method ignores the existence of hospital emergency rooms, teaching hospitals and clinics with residents, emergency paramedical and ambulance services, neighborhood clinics, mid-level practitioners, and other delivery systems for primary-health care. This method also ignores the transportation potential of the urban community, and the natural patterns of movement as people travel to various locations to work and to obtain essential services.

In taking this position, the Commission is not arguing that all people in California's urban areas are actually in a position to obtain health care within a reasonable distance. There are many other barriers--cultural, linguistic, economic, and psychological--which may prevent people from obtaining the health care which is close at hand. The Commission is simply pointing out that in urban areas common sense must be utilized in determining what is physically available to people and what is not.

The Commission recommends:

Recommendation 3

The health manpower and health science education planners of the State should develop standards for assessing the adequacy of the total health care which is available to urban and rural Californians, reflecting normal patterns of mobility but taking into account the barriers--cultural, linguistic, economic, and psychological--which may affect the utilization of existing health care resources.

Before leaving this discussion of medical underservice, it should be noted that during the development of this chapter several members of the Commission suggested that the training of physicians who serve in remote areas is inadequate to meet the full needs of the people of those areas, and that this situation serves as a barrier to proper health care. While an assessment of the adequacy of medical education is not within the purview of this Plan (other than in terms of numbers of physicians being trained), it should be pointed out that in rapidly changing fields such as medicine no practitioner, whether specialist or generalist, can hope to be current in every conceivable development in medicine which might be beneficial to any of his or her patients. The imposition of mandatory continuing education in medicine is an attempt to recognize the need for all physicians to try to stay reasonably current in their fields, but it is also a commentary on the fact that the original medical education of physicians can provide only a finite amount of knowledge and experience to equip them to practice a profession which involves an infinite variety of judgments and experiences.

But even if it could be shown that the practice of medicine in remote areas could be improved through better initial medical education, graduate medical education, or continuing education of physicians practicing in such areas, there are other factors which may limit the benefit of such improved education--particularly malpractice insurance rates. In recent years, large numbers of family physicians in California--those physicians best qualified to serve the total medical needs of isolated areas--have given up surgery and obstetrics in their practices to save the high cost of the malpractice insurance covering these procedures. The skills of these physicians and their ability to serve the total needs of their communities will diminish in these circumstances, irrespective of whether they have received better training than before.

Therefore, there may indeed be additional barriers to quality health care imposed by the limited training of physicans for those who choose to live in remote areas. However, the same situation prevails in family practice in urban settings--where even higher malpractice insurance rates serve to narrow the scope of family practice--throwing out of balance the established patient choice between the breadth of family practice and the depth of specialized medicine.

The Status of Nurse Practitioners

Recent efforts by the Legislature and the Board of Registered Nursing have not clarified the ambiguity surrounding the nurse practitioner as a mid-level medical practitioner. Questions still arise concerning the nature and role of this health professional, and the scope of practice of such persons, both under AB 1503 and outside of the special status conferred by that legislation. The State's higher education establishment cannot properly assist in the development of appropriate educational programs for nurse practitioners until these questions are resolved and until the educational level of the nurse practitioner is mutually agreed upon by nurses, physicians, and licensing authorities.

Recommendation 4

> *The State should provide for the certification of nurse practitioners and should further define this profession and the scope of its practice. The educational and experiential requirements for certification should be established at a standardized professional level, but should provide for a variety of paths to the attainment of those requirements.*

Diversity in Medical Education

The Commission acknowledges that, as a result of its decision to deal with underrepresentation of various groups in health sciences education in a separate chapter of its Plan, this chapter on medical education may seem incomplete, in that it does not examine the question of who becomes a physician in California. It is not the intent of the Commission to ignore this question; indeed, the Commission is interested in the diversity of the students admitted to medical schools, and in the efforts made by medical schools to cultivate in their students an appreciation of the diversity of the people of California who will soon be their patients. Therefore, the Commission offers the following recommendation.

Recommendation 5

> *The State should encourage, through appropriate means, the recruitment of medical students and residents from diverse backgrounds, cultures, and languages, and should encourage, through the medical education programs it supports, the development of sensitivity on the part of physicians to the needs of people as individuals and as members of diverse cultures and groups.*

TABLE M-16

Location, Affiliation, and Size of Residencies in Various Medical Fields

Location*	Medical School Affiliation of Hospital	Number of Training Slots
ALLERGY AND IMMUNOLOGY		
Non-Federal and VA		
Stanford University	S	1
ANESTHESIOLOGY		
Military/Federal		
Letterman Army Medical Center, SF		9
Naval Regional Medical Center, Oakland		12
Naval Regional Medical Center, San Diego		18
Non-Federal and VA		
Sacramento Medical Center	UCD	16
UCI Affiliated Hospitals Orange County Medical Center VA, Long Beach	UCI	3
Children's Hosp. of Los Angeles	USC, UCI, LL	9
Loma Linda Affiliated Hospitals	LL	21
LA County-USC Medical Center	USC	43
UCLA Affiliated Hospitals	UCLA	47
Martin Luther King Jr. Gen. Hosp., LA	UCLA	18
Mercy Hospital, San Diego	UCSD	6
UCSD Affiliated Hospitals University Hospital VA, San Diego	UCSD	22
UCSF Program Moffitt Hospital San Francisco General VA, San Francisco	UCSF	47
Santa Clara Valley Med. Cent., San Jose	S	4
Stanford Affiliated Hospitals Stanford University VA, Palo Alto	S	34
LA County-Harbor General	UCLA	21

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*Additional sites not listed here may serve to house satellite operations of residencies which are based in the locations identified in this table. Those sites for the University of California are listed in Table M-17, on page 71.

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
BLOOD BANKING		
Non-Federal and VA		
LA County-Harbor General	UCLA	1
DERMATOLOGY		
Military/Federal		
Letterman Army Medical Center, SF		9
Naval Regional Med. Cent., San Diego		12
Non-Federal and VA		
UCI Affiliated Hospitals Orange County Medical Center VA, Long Beach	UCI	12
LA County-USC Medical Center	USC	10
Martin Luther King Jr. Gen. Hosp., LA	UCLA	6
UCLA Hospital and Clinics	UCLA	11
VA, Wadsworth	UCLA	8
UCSD Affiliated Hospitals University Hospital VA, San Diego	UCSD	5
UCSF Program Moffitt Hospital San Francisco General VA, San Francisco	UCSF	15
Stanford Affiliated Hospitals Stanford University VA, Palo Alto Pac. Med. Cent.-Presbyterian, SF	S	12
FAMILY PRACTICE		
Military/Federal		
Fort Ord Army Medical Center		15
Camp Pendleton Marine Hospital		28
Non-Federal and VA		
Kern Medical Center, Bakersfield	UCLA, UCSD	12

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCD Affiliated Hospitals	UCD	111
Davis Community Hospital		
Merced Community Hospital		
Sacramento Medical Center		
Shasta General, Redding		
Kaiser-Fontana	LL	18
Valley Medical Center, Fresno	UCSF	28
Glendale Adventist Medical Center	LL	18
UCI Affiliated Hospitals	UCI	51
Orange County Medical Center		
UCLA-Antelope Valley	UCLA	13
Antelope Valley Hospital		
Cedars-Sinai, LA		
Long Beach Memorial Hosp. Med. Cent.	UCI	13
Kaiser Foundation, LA		18
King-Drew Medical Center, LA	UCLA	18
UCLA Hospital and Clinics	UCLA	16
Contra Costa Medical Services, Martinez	UCD	18
Scenic General, Modesto	UCD, UCSF	15
Northridge Hospital Foundation	UCLA	4
Riverside General	LL	14
Natividad Medical Center, Salinas		18
San Bernardino County Medical Center	LL, UCLA	48
UCSD University Hospital	UCSD	18
UCSF Program	UCSF	24
San Francisco General		
San Jose Hospital and Health Center		10
Santa Monica Hospital Medical Center	UCLA	21
Santa Rosa Community Hosp. of Sonoma County	UCSF	28
San Joaquin General, Stockton	UCD, S	17
Harbor General, Torrance	UCLA, UCI	12
Ventura General Hospital		30
INTERNAL MEDICINE		
Military/Federal		
Letterman Army Medical Center, SF		26
Naval Regional Medical Center, Oakland		14
Naval Regional Medical Center, San Diego		73
U.S. Public Health Service, SF		19

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Non-Federal and VA		
Kern County General, Bakersfield	UCLA	22
UCD Affiliated Hospitals	UCD	54
Sacramento Medical Center		
Valley Medical Center, Fresno	UCSF	31
UCI Affiliated Hospitals	UCI	
Orange County Medical Center		103
Memorial Hosp. Med. Cent., Long Beach		29
VA, Long Beach		82
Loma Linda Affiliated Hospitals	LL	57
Loma Linda University		
Riverside General		
St. Mary's Medical Center, Long Beach	UCLA	28
Cedars-Sinai Medical Center, LA	UCLA	58
Good Samaritan Medical Center, LA	USC	16
Kaiser Foundation, LA		24
LA County-USC Medical Center	USC	222
Martin Luther King Jr. Gen. Hosp., LA	UCLA	42
UCLA Hospital and Clinics	UCLA	72
UCLA San Fernando Valley Program	UCLA	56
VA, Sepulveda, LA		
LA County-Olive View Medical Center		
VA, Wadsworth, LA	UCLA	94
White Memorial Medical Center, LA	LL	12
VA, Martinez	UCD	46
Highland General, Oakland	UCSF	29
Kaiser Foundation, Oakland	UCSF	18
Kaiser Foundation, Panorama City		8
Huntington Memorial, Pasadena	USC	22
Mercy Hosp. and Med. Cent., San Diego	UCSD	28
UCSD Affiliated Hospitals	UCSD	80
University Hospital		
VA, San Diego		
Children's Hospital, SF	UCSF	21
Kaiser Foundation, SF	UCSF	25
Mt. Zion Hosp. and Med. Cent., SF	UCSF	24
Pacific Med. Cent.-Presbyterian, SF	S, UCSF	17
St. Mary's Hosp. and Med. Cent., SF	UCSF	35
UCSF Program	UCSF	94
Moffitt Hospital		
San Francisco General		
VA, San Francisco		

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Santa Clara Valley Med. Cent., San Jose	S, UCSF	22
Santa Barbara General-Cottage Hospitals		3
Kaiser Foundation, Santa Clara	S	17
Stanford Affiliated Hospitals	S	55
Stanford University		
VA, Palo Alto		
San Joaquin General Stockton	UCSF, UCD	11
LA County-Harbor General, Torrance	UCLA, UCI	83

NEUROLOGICAL SURGERY

Non-Federal and VA

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCD Affiliated Hospitals	UCD	5
Sacramento Medical Center		
UCI Affiliated Hospitals	UCI	6
Orange County Medical Center		
VA, Long Beach		
Loma Linda Affiliated Hospitals	LL	7
LA County-USC Medical Center	USC	18
Huntington Memorial, Pasadena		
UCLA Affiliated Hospitals	UCLA	10
VA, Wadsworth		
LA County-Harbor General, Torrance		
UCSF Program	UCSF	11
Moffitt Hospital		
San Francisco General		
VA, San Francisco		
Stanford Affiliated Hospitals	S	5
Stanford University		
VA, Palo Alto		
Santa Clara Valley Med. Cent., San Jose		

NEUROLOGY

Military/Federal

Location	Medical School Affiliation of Hospital	Number of Training Slots
Letterman Army Medical Center, SF		8

Non-Federal and VA

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCD Affiliated Hospitals	UCD	11

61

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCI Affiliated Hospitals	UCI	9
Orange County Medical Center		
VA, Long Beach		
Kaiser Foundation, LA		3
LA County-USC Medical Center	USC	20
UCLA Hospital and Clinics	UCLA	16
VA, Wadsworth, LA	UCLA	15
UCSD Affiliated Hospitals	UCSD	16
University Hospital		
VA, San Diego		
Pacific Medical Center, SF	S, UCSF	3
Pacific Med. Cent.-Presbyterian		
Children's Hospital, Oakland		
Mt. Zion Hospital, SF		
UCSF Program	UCSF	14
Moffitt Hospital		
San Francisco General		
VA, San Francisco		
Stanford Affiliated Hospitals	S	15
Stanford University		
VA, Palo Alto		
LA County-Harbor General, Torrance	UCLA, UCI	9
NUCLEAR MEDICINE		
Military/Federal		
Letterman Army Medical Center, SF		2
Non-Federal and VA		
UCD Affiliated Hospitals	UCD	8
Sacramento Medical Center		
Memorial Hospital, Long Beach	UCI	1
VA, Long Beach	UCI	2
UCLA Hospital and Clinics	UCLA	3
VA, Wadsworth, LA	UCLA	4
VA, Sepulveda, LA	UCLA	4
UCSD Affiliated Hospitals	UCSD	2
University Hospital		
VA, San Diego		
UCSF Program	UCSF	5
Moffitt Hospital		
Davies Medical Center-Franklin		

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Stanford Affiliated Hospitals	S	4
Stanford University		
VA, Palo Alto		
OBSTETRICS-GYNECOLOGY		
Military/Federal		
Air Force Medical Center, Fairfield		14
Letterman Army Medical Center, SF		10
Naval Regional Med. Cent., Oakland		12
Naval Regional Med. Cent., San Diego		24
Non-Federal and VA		
Kern County General, Bakersfield	UCLA	10
UCD Affiliated Hospitals	UCD	12
Sutter Community Hosp., Sacramento		
Sacramento Medical Center		
Valley Medical Center, Fresno	UCSF	19
Adventist Medical Center, Glendale	LL	8
UCI Affiliated Hospitals	UCI	27
Orange County Medical Center		
Memorial Hospital, Long Beach		
Loma Linda Affiliated Hospitals	LL	12
Loma Linda University		
Riverside General		
California Hospital Medical Center, LA	USC	8
Cedars-Sinai Medical Center, LA	UCLA	16
Kaiser Foundation, LA	USC	16
LA County-USC Medical Center	USC	54
Martin Luther King Jr. Gen. Hosp., LA	UCLA	23
UCLA Hospital and Clinics	UCLA	20
White Memorial Medical Center, LA	LL, USC	12
Rancho Los Amigos, Downey		
Santa Marta Hospital		
Kaiser Foundation, Oakland	UCSF	12
Kaiser Foundation, Sacramento	UCD	8
San Bernardino County Medical Center	LL, UCLA	8
Kaiser Foundation, Fontana		
Mercy Hospital, San Diego	UCSD	8
UCSD University Hospital	UCSD	17
Kaiser Foundation, SF	UCSF	9
Mt. Zion Hosp. and Med. Cent., SF	UCSF	4

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCSF Program	UCSF	26
Children's Hospital		
Moffitt Hospital		
San Francisco General		
Stanford Affiliated Hospitals	S	18
Stanford University		
Santa Clara Valley Med. Cent., San Jose		
Kaiser Foundation, Santa Clara		
San Joaquin General, Stockton	UCSF, UCD	8
LA County-Harbor General, Torrance	UCLA, UCI	26
Memorial Hospital, Long Beach		
OPHTHALMOLOGY		
Military/Federal		
Letterman Army Medical Center, SF		6
Naval Regional Med. Cent., Oakland		6
Naval Regional Med. Cent., San Diego		9
U.S. Public Health Service, SF		5
Non-Federal and VA		
Kern County General, Bakersfield	UCLA	3
UCD Affiliated Hospitals	UCD	7
Sacramento Medical Center		
VA, Martinez		
Valley Medical Center, Fresno	UCSF	13
UCI Affiliated Hospitals	UCI	8
Orange County Medical Center		
VA, Long Beach		
Loma Linda Affiliated Hospitals	LL	6
Loma Linda University		
Riverside General		
Hollywood Presbyterian Med. Center, LA		6
LA County-USC Medical Center	USC	18
Martin Luther King Jr. Gen. Hosp., LA	UCLA	6
UCLA Hospital and Clinics	UCLA	14
VA, Sepulveda, LA		
VA, Wadsworth, LA	UCLA	9

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
White Memorial Medical Center, LA	LL, USC	9
Santa Fe Memorial		
Rancho Los Amigos, Downey		
Glendale Adventist Medical Center		
Olive View Medical Center, Sylmar		
UCSD Affiliated Hospitals	UCSD	6
University Hospital		
VA, San Diego		
Pacific Med. Cent.-Presbyterian, SF	UCSF	9
Highland General, Oakland		
UCSF Program	UCSF	18
Moffitt Hospital		
VA, San Francisco		
Stanford Affiliated Hospitals	S	9
Stanford University		
VA, Palo Alto		
Santa Clara Valley Med. Cent., San Jose		
ORTHOPEDIC SURGERY		
Military/Federal		
Letterman Army Medical Center, SF		12
Shriners Hosp. for Crippled Children SF		
Shriners Hosp. for Crippled Children, LA		
Naval Regional Medical Center, Oakland		11
Naval Regional Medical Cent., San Diego		16
Non-Federal and VA		
UCD Affiliated Hospitals	UCD	12
Kaiser Foundation, Sacramento		
Sacramento Medical Center		
UCI Affiliated Hospitals	UCI	15
Children's Hospital of Orange County		
Orange County Medical Center		
Fairview State, Costa Mesa		
VA, Long Beach		

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Loma Linda Affiliated Hospitals	LL	16
Loma Linda University		
Rancho Los Amigos, Downey		
Kaiser Foundation, Fontana		
Riverside General		
San Bernardino County Med. Center, San B.		
LA County-USC Medical Center	USC	32
Children's Hospital of Los Angeles		
Rancho Los Amigos, Downey		
Martin Luther King Jr. Gen. Hosp. LA	UCLA	8
Orthopedic Hospital, LA	USC	12
LA County-USC Medical Center		
VA, Sepulveda		
LA County-Harbor General, Torrance		
UCLA Affiliated Hospitals	UCLA	24
UCLA Hospital and Clinics		
Shriners Hospital for Crippled Children, LA		
White Memorial Medical Center, LA	LL, USC	8
Adventist Medical Center, Glendale		
LA County-USC Medical Center		
Rancho Los Amigos, Downey		
Highland General, Oakland		4
UCSD Affiliated Hospitals	UCSD	16
University Hospital		
Children's Hosp. and Health Center		
Donald N. Sharp Memorial Community		
Mercy Hospital and Medical Center		
VA, San Diego		
SF Orthopedic Residency Training Program		12
Mary's Help, Daly City		
Kaiser Foundation		
St. Joseph's		
St. Mary's Hospital and Medical Center		
VA, Martinez		

PATHOLOGY

Military/Federal

Letterman Army Medical Center, SF		8
Naval Regional Medical Center, Oakland		8
Naval Regional Medical Cent., San Diego		12

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Non-Federal and VA		
UCD Affiliated Hospitals Sacramento Medical Center	UCD	9
City of Hope Medical Center, Duarte	LL	2
UCI Affiliated Hospitals Orange County Medical Center Memorial Hospital, Long Beach	UCI	16
Loma Linda Affiliated Hospitals Loma Linda University	LL	10
St. Mary's Medical Center, Long Beach	UCLA	2
VA, Long Beach	UCI	10
Cedars-Sinai Medical Center, LA	UCLA	10
Children's Hospital, LA	USC, UCI, LL	10
Kaiser Foundation, LA		6
LA County-USC Medical Center	USC	35
UCLA Hospital and Clinics	UCLA	24
VA, Wadsworth, LA	UCLA	12
White Memorial Medical Center, LA	LL, USC	4
VA, Martinez		9
Donald N. Sharp Memorial Community, San Diego	UCSD	4
Mercy Hospital and Med. Cent., San Diego	UCSD	5
UCSD Affiliated Hospitals University Hospital VA, San Diego	UCSD	25
Kaiser Foundation, SF	UCSF	7
Mt. Zion Hosp. and Med. Cent., SF	UCSF	6
Pacific Med. Cent.-Presbyterian, SF	UCSF	4
UCSF Program Moffitt Hospital San Francisco General VA, San Francisco	UCSF	26
Stanford Affiliated Hospitals Stanford University VA, Palo Alto	S	17
LA County-Harbor General, Torrance	UCLA, UCI	16
PATHOLOGY, FORENSIC		
Non-Federal and VA		
Dept. of Chief Med. Examiner, LA County Coroner		6

70

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Institute of Forensic Sciences, Oakland		1
Sacramento County Coroner's Office		1
UC Medical Center, SF	UCSF	1
Santa Clara County Med. Examiner-Coroner		1
PATHOLOGY, NEUROPATHOLOGY		
Non-Federal and VA		
UCD Affiliated Hospitals	UCD	2
LA County-USC Medical Center	USC	1
UCSF Program Moffitt Hospital San Francisco General VA, San Francisco	UCSF	1
Stanford University Affiliated Hospitals Stanford University VA, Palo Alto	S	5
PEDIATRICS		
Military/Federal		
Air Force Medical Center, Fairfield		12
Letterman Army Medical Center, SF		9
Navy Regional Medical Center, Oakland		9
Navy Regional Medical Cent., San Diego		15
Non-Federal and VA		
UCD Affiliated Hospitals Sacramento Medical Center	UCD	20
Valley Medical Center, Fresno	UCSF	22
UCI Affiliated Hospitals Children's Hospital of Orange County Orange County Medical Center Memorial Hospital, Long Beach	UCI	54
Loma Linda Affiliated Hospitals Loma Linda University	LL	31
Cedars-Sinai Medical Center	UCLA	14
Children's Hospital of Los Angeles	USC, UCI, LL	66
Kaiser Foundation, LA		11
LA County-USC Medical Center	USC	27
Martin Luther King Jr. Gen. Hosp., LA	UCLA	27

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCLA Hospital and Clinics	UCLA	32
White Memorial Medical Center, LA	LL, USC	8
Children's Hosp. Med. Cent., Oakland	UCSF, S	34
Kaiser Foundation, Oakland	UCSF	8
UCSD Affiliated Hospitals	UCSD	31
University Hospital		
Mercy Hospital, San Diego		
Children's Hospital, SF	UCSF	15
Kaiser Foundation, SF	UCSF	11
Mt. Zion Hosp. and Med. Cent., SF	UCSF	14
UCSF Program	UCSF	39
Moffitt Hospital		
San Francisco General		
Santa Clara Valley Med. Cent., San Jose	S, UCSF	14
UCSF Program	UCSF	49
Moffitt-UC Hospitals		
Children's Hospital		
Mt. Zion Hospital and Medical Center		
Pacific Medical Center-Presbyterian		
Ralph K. Davies Med. Cent.-Franklin		
San Francisco General		
Shriners Hosp. for Crippled Children		
VA, San Francisco		
Children's Hosp. Med. Cent., Oakland		
Highland General, Oakland		
Kaiser Foundation, Oakland		
Samuel Merritt, Oakland		
Stanford Affiliated Hospitals	S	16
Stanford University		
VA, Palo Alto		
Santa Clara Valley Med. Cent., San Jose		
Kaiser Foundation, Santa Clara		
LA County-Harbor General, Torrance	UCLA, UCI	15
Orthopedic, LA		
OTOLARYNGOLOGY		
Military/Federal		
Naval Regional Medical Center, Oakland		9
Naval Regional Medical Center, San Diego		12

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Non-Federal and VA		
UCD Affiliated Hospitals	UCD	8
Sacramento Medical Center		
UCI Affiliated Hospitals	UCI	12
Orange County Medical Center		
VA, Long Beach		
LA County-USC Medical Center	USC	20
Martin Luther King Jr. Gen. Hosp., LA	UCLA	6
UCLA Hospital and Clinics	UCLA	12
LA County-Harbor General, Torrance		
VA, Wadsworth, LA	UCLA	9
White Memorial Medical Center, LA	LL, USC	8
Kaiser Foundation, Oakland	UCSF	6
UCSD University Hospital	UCSD	8
UCSF Program	UCSF	12
Moffitt Hospital		
San Francisco General		
Valley Medical Center, Fresno		
VA, Fresno		
VA, San Francisco		
Stanford Affiliated Hospitals	S	12
Stanford University		
VA, Palo Alto		
Santa Clara Valley Med. Cent., San Jose		
Stanford Affiliated Hospitals	S	35
Stanford University		
LA County-Harbor General, Torrance	UCLA, UCI	24
PEDIATRIC ALLERGY		
Non-Federal and VA		
UCI Affiliated Hospitals	UCI	2
Orange County Medical Center		
Children's Hospital of Los Angeles	USC, UCI, LL	2
Kaiser Foundation, LA		2
LA County-USC Medical Center	USC	3
UCLA Hospital and Clinics	UCLA	6
UCSD University Hospital	UCSD	4
Kaiser Foundation, SF	UCSF	2
UCSF Program	UCSF	3
Moffitt Hospital		

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Stanford Affiliated Hospitals Stanford University	S	4
LA County-Harbor General, Torrance	UCLA, UCI	4
PEDIATRIC CARDIOLOGY		
Non-Federal and VA		
Children's Hospital of Los Angeles	LL, USC, UCI	2
UCLA Hospital and Clinics	UCLA	3
UCSD University Hospital	UCSD	3
UCSF Program Moffitt Hospital	UCSF	7
Stanford Affiliated Hospitals Stanford University	S	2
PHYSICAL MEDICINE AND REHABILITATION		
Military/Federal		
Letterman Army Medical Center, SF Kaiser Foundation, Vallejo		3
Non-Federal and VA		
UCD Affiliated Hospitals Sacramento Medical Center VA, Martinez	UCD	8
UCI Affiliated Hospitals Orange County Medical Center Memorial Hospital, Long Beach VA, Long Beach	UCI	12
LA County-USC Medical Center	USC	3
VA, Wadsworth, LA	UCLA	9
Stanford Affiliated Hospitals VA, Palo Alto Santa Clara Valley Med. Cent., San Jose	S	8
PLASTIC SURGERY		
Non-Federal and VA		
UCI Affiliated Hospitals Orange County Medical Center VA, Long Beach	UCI	4

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCLA Affiliated Hospitals UCLA Hospital and Clinics VA, Wadsworth Rancho Los Amigos, Downey VA, Sepulveda LA County-Harbor General, Torrance	UCLA	6
UCSD Affiliated Hospitals University Hospital VA, San Diego	UCSD	2
St. Francis Memorial, SF		6
UCSF Program Moffitt Hospital Ralph K. Davies Med. Cent.-Franklin San Francisco General VA, San Francisco	UCSF	4
Stanford Affiliated Hospitals Stanford University VA, Palo Alto Santa Clara Valley Med. Cent., San Jose	S	8
PREVENTIVE MEDICINE		
Non-Federal and VA		
UC Berkeley School of Public Health		NA
Charles R. Drew Postgrad. Med. School, LA		NA
UCLA School of Med./School of Public Health		NA
PUBLIC HEALTH		
Non-Federal and VA		
State of California, Sacramento Participating counties: Alameda, Contra Costa, Los Angeles, Orange, Riverside, Sacramento San Bernardino, San Diego, San Francisco, San Mateo, Santa Clara, Santa Cruz, Yolo, and City of Berkeley		NA

7

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
OCCUPATIONAL MEDICINE (IN PLANT)		
Non-Federal and VA		
Kaiser Steel Corporation, Fontana		1
PSYCHIATRY		
Military/Federal		
Letterman Army Medical Center, SF		21
Non-Federal and VA		
Herrick Memorial, Berkeley		11
Camarillo State	UCLA	12
UCD Affiliated Hospitals	UCD	42
Sacramento Medical Center		
Stockton State		
Fresno County Dept. of Heath/Mental H. Serv.		9
Fresno County Dept. of Health		
Valley Medical Center, Fresno		
UCI Affiliated Hospitals	UCI	46
Orange County Medical Center		
VA, Long Beach		
Loma Linda Affiliated Hospitals	LL	20
Loma Linda University		
Cedars-Sinai Medical Center, LA	UCLA	21
LA County-USC Medical Center	USC	85
Martin Luther King Jr. Gen. Hosp., LA	UCLA	15
UCLA Affiliated Hospitals	UCLA	76
UCLA Neuropsychiatric Institute		
VA, Brentwood		
VA, Sepulveda, LA	UCLA	25
Highland General, Oakland	UCSF	9
Napa State Hospital		15
UCSD Affiliated Hospitals	UCSD	36
University Hospital		
VA, San Diego		
Mt. Zion Hosp. and Med. Cent., SF	UCSF	17
Pacific Med. Cent.-Presbyterian, SF	S, UCSF	9
St. Mary's Hospital and Medical Center, SF	UCSF	18

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCSF Program	UCSF	48
Langley Porter Neuropsychiatric Institute		
VA, San Francisco		
San Mateo Community Mental Health Services		15
Stanford Affiliated Hospitals	S	36
Stanford University		
VA, Palo Alto		
Santa Clara Valley Med. Cent., San Jose		
Olive View Medical Center, Sylmar	UCLA	9
LA County-Harbor General, Torrance	UCLA, UCI	20
CHILD PSYCHIATRY		
Military/Federal		
Letterman Army Medical Center, SF		5
Non-Federal and VA		
Camarillo State Hospital	UCLA	6
UCD Affiliated Hospitals	UCD	8
Sacramento Medical Center		
UCI Affiliated Hospitals	UCI	5
Orange County Medical Center		
Cedars-Sinai Medical Center, LA	UCLA	3
Children's Hospital of Los Angeles	USC, UCI, LL	4
LA County-USC Medical Center	USC	12
Reiss-Davis Child Study Center, LA		2
UCLA Neuropsychiatric Institute, LA	UCLA	24
Napa State Hospital		4
Pasadena Child Guidance Clinic		2
Children's Hospital, SF	UCSF	2
Mt. Zion Hosp. and Med. Cent., SF	UCSF	4
St. Mary's Hosp. and Med. Cent., SF	UCSF	6
UCSF Program	UCSF	4
Langley Porter Neuropsychiatric Institute		
Stanford Affiliated Hospitals	S	9
Stanford University		
LA County-Harbor General, Torrance	UCI, UCLA	4

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
RADIOLOGY		
Non-Federal and VA		
VA, Long Beach	UCI	21
White Memorial Medical Center, Long Beach	LL, USC	3
RADIOLOGY, DIAGNOSTIC		
Military/Federal		
Air Force Medical Center, Fairfield		12
Letterman Army Medical Center, SF		15
Naval Regional Medical Center, Oakland		9
Naval Regional Medical Center, San Diego		18
Non-Federal and VA		
UCD Affiliated Hospitals Sacramento Medical Center Sutter Community Hospitals, Sacramento	UCD	15
UCI Affiliated Hospitals Orange County Medical Center Memorial Hospital, Long Beach VA, Long Beach	UCI	33
St. Mary's Medical Center, Long Beach	UCI	1
Cedars-Sinai Medical Center, LA	UCLA	8
Hosp. of the Good Samaritan Med. Cent., LA	USC	3
Kaiser Foundation, LA		4
LA County-USC Medical Center	USC	35
Martin Luther King Jr. Gen. Hosp., LA	UCLA	15
UCLA Hospital and Clinics	UCLA	26
VA, Wadsworth, LA	UCLA	25
White Memorial Medical Center, LA	LL	10
VA, Martinez	UCD	10
UCSD Affiliated Hospitals University Hospital VA, San Diego	UCSD	26
Children's Hospital, SF	UCSF	2
Mt. Zion Hosp. and Med. Cent., SF	UCSF	12
St. Mary's Hosp. and Med. Cent., SF	UCSF	5

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCSF Program	UCSF	41
Moffitt Hospital		
San Francisco General		
VA, San Francisco		
Santa Clara Valley Medical Center, San Jose	S, UCSF	9
Santa Barbara General-Cottage Hospitals		4
Santa Barbara General		
Santa Barbara Cottage		
Cancer Foundation of Santa Barbara		
Stanford Affiliated Hospitals	S	25
Stanford University		
VA, Palo Alto		
LA County-Harbor General, Torrance	UCLA, UCI	19
RADIOLOGY, THERAPEUTIC		
Military/Federal		
Naval Regional Medical Center, San Diego		3
Non-Federal and VA		
UCD Affiliated Hospitals	UCD	3
Sacramento Medical Center		
Sutter Community Hospitals, Sacramento		
UCI Affiliated Hospitals	UCI	4
Orange County Medical Center		
Children's Hospital of Orange County		
St. Joseph's, Orange		
VA, Long Beach		
Loma Linda University	LL	4
LA County-USC Medical Center	USC	12
UCLA Hospital and Clinics	UCLA	6
VA, Wadsworth, LA	UCLA	2
UCSD University Hospital	UCSD	3
Mt. Zion Hosp. and Med. Cent., SF	UCSF	3
St. Mary's Hospital Affiliated Hospitals, SF	UCSF, S	
Pacific Medical Center-Presbyterian		
St. Mary's Hosp. and Med. Cent.		
St. Francis Memorial		
Santa Rosa Radiation Therapy Cent., Santa Rosa		

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
UCSF Program	UCSF	11
Moffitt Hospital		
Ralph K. Davies Med. Cent.-Franklin		
San Francisco General		
Stanford Affiliated Hospitals	S	15
Stanford University		
VA, Palo Alto		
Santa Clara Valley Med. Cent., San Jose		
LA County-Harbor General, Torrance	UCLA, UCI	2
City of Hope Medical Center, Duarte	LL	
SURGERY		
Military/Federal		
Air Force Medical Center, Fairfield		14
Letterman Army Medical Center, SF		12
Naval Regional Medical Center, Oakland		10
Naval Regional Medical Center, San Diego		37
U.S. Public Health Service, SF		13
Non-Federal and VA		
Kern County General, Bakersfield	UCLA	18
UCD Affiliated Hospitals	UCD	38
Sacramento Medical Center		
Kaiser Foundation, Sacramento		
Sutter Community Hospitals, Sacramento		
Valley Medical Center, Fresno	UCSF	26
UCI Affiliated Hospitals	UCI	45
Children's Hospital of Orange County		
Orange County Medical Center		
VA, Long Beach		
Loma Linda Affiliated Hospitals	LL	34
Loma Linda University		
Riverside General		
Memorial Hospital Med. Cent., Long Beach	UCI	12
Naval Regional Medical Center		
California Hospital Med. Cent., LA	USC	6
Cedars-Sinai Medical Center, LA	UCLA	17
Kaiser Foundation, LA		15
LA County-USC Medical Center	USC	74
Martin Luther King Jr. Gen. Hosp., LA	UCLA	23

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Queen of Angels, LA		8
UCLA Affiliated Hospitals	UCLA	78
UCLA Hospital and Clinics		
San Bernardino County Med. Cent.		
VA, Sepulveda, LA		
VA, Wadsworth, LA		
White Memorial Medical Center, LA	USC, LL	15
VA, Martinez	UCD	16
Highland General, Oakland	UCSF	21
Kaiser Foundation, Oakland	UCSF	12
Kaiser Foundation, Panorama City		6
Huntington Memorial, Pasadena	USC	11
Kaiser Foundation, Sacramento	UCD	8
UCSD Affiliated Hospitals	UCSD	59
University Hospital		
VA, San Diego		
Kaiser Foundation, SF	UCSF	16
Mt. Zion Hosp. and Med. Cent., SF	UCSF	12
St. Mary's Hosp. and Med. Cent., SF	UCSF	23
UCSF Program	UCSF	54
Moffitt Hospital		
Children's Hospital		
San Francisco General		
VA, San Francisco		
Santa Barbara General-Cottage Hospitals		11
Santa Barbara General		
Santa Barbara Cottage		
Stanford Affiliated Hospitals	S	37
Stanford University		
VA, Palo Alto		
Santa Clara Valley Med. Cent., San Jose		
San Joaquin General, Stockton	UCD, UCSF	8
LA County-Harbor General, Torrance	UCLA, UCI	42

THORACIC SURGERY

Military/Federal

Location	Medical School Affiliation of Hospital	Number of Training Slots
Letterman Army Medical Center, SF		2
Naval Regional Medical Center, San Diego		2

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Non-Federal and VA		
UCD Affiliated Hospitals	UCD	2
Sacramento Medical Center		
UCI Affiliated Hospitals	UCI	4
Orange County Medical Center		
VA, Long Beach		
Hosp. of the Good Samaritan Med. Cent., LA	USC	4
LA County-USC Medical Center	USC	2
UCLA Hospital and Clinics	UCLA	4
VA, Wadsworth, LA		
UCSD Affiliated Hospitals	UCSD	2
University Hospital		
VA, San Diego		
UCSF Program	UCSF	2
Moffitt Hospital		
VA, San Francisco		
Stanford Affiliated Hospitals	S	8
Stanford University		
Santa Clara Valley Med. Cent., San Jose		
UROLOGY		
Military/Federal		
Letterman Army Medical Center, SF		4
Naval Regional Medical Center, Oakland		5
Naval Regional Medical Center, San Diego		8
Non-Federal and VA		
UCD Affiliated Hospitals	UCD	7
Kaiser Foundation, Sacramento		
Sacramento Medical Center		
VA, Martinez		
UCI Affiliated Hospitals	UCI	8
Orange County Medical Center		
VA, Long Beach		
Loma Linda Affiliated Hospitals	LL	4
Loma Linda University		
Riverside General		
Kaiser Foundation, Los Angeles		6

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
LA County-USC Medical Center	USC	15
UCLA Affiliated Hospitals	UCLA	12
UCLA Hospital and Clinics		
VA, Sepulveda, LA		
VA, Wadsworth, LA		
LA County-Harbor General, Torrance		
White Memorial Medical Center, LA	LL, USC	4
UCSD Affiliated Hospitals	UCSD	8
Mercy Hospital and Medical Center		
University Hospital		
VA, San Diego		
UCSF Program	UCSF	15
Moffitt Hospital		
San Francisco General		
VA, San Francisco		
Stanford Affiliated Hospitals	S	8
Stanford University		
VA, Palo Alto		
Santa Clara Valley Med. Cent., San Jose		
Kaiser Foundation, Santa Clara		
FLEXIBLE RESIDENCIES		
Military/Federal		
Air Force Medical Center, Fairfield		6
Letterman Army Medical Center, SF		15
Naval Regional Medical Center, Oakland		32
Naval Regional Medical Center, San Diego		51
U.S. Public Health Service, SF		6
Non-Federal and VA		
Kern Medical Center, Bakersfield	UCLA, UCSD	4
Valley Medical Center, Fresno	UCSF	10
LA County-USC Medical Center	USC	52
VA, Wadsworth, LA	UCLA	8
White Memorial Medical Center, LA	LL	15
Highland General, Oakland	UCSF	15
San Bernardino County Medical Center	LL, UCLA	2
Mercy Hospital, San Diego	UCSF	12

TABLE M-16 (Continued)

Location	Medical School Affiliation of Hospital	Number of Training Slots
Pacific Medical Center Affiliated Hospitals	S, UCSF	5
Pacific Medical Center-Presbyterian, SF		
St. Mary's Hosp. and Med. Cent., SF	UCSF	8
UCSF Program	UCSF	32
Moffitt Hospital		
San Francisco General		
Santa Clara Valley Medical Center, San Jose	S	4
San Joaquin General, Stockton	UCD, S	6
LA County-Harbor General, Torrance	UCLA	20

Source: Liaison Committee on Graduate Medical Education and the American Medical Association

TABLE M-17

Locations at Which University of California Housestaff Receive at Least Part of Their Training

DAVIS

1. UCD Medical Center, Sacramento
2. Kaiser Foundation Hospital, Sacramento
3. Sutter Community Hospital, Sacramento
4. USAF Hospital Mather, Mather AFB
5. Mercy General Hospital, Sacramento
6. Mercy San Juan Hospital, Carmichael
7. Woodland Memorial Hospital, Woodland
8. Eskaton American River Health Care Center, Carmichael
9. Roseville Community Hospital, Roseville
10. Davis Community Hospital, Davis
11. David Grant USAF Medical Center, Travis AFB
12. Veterans Administration Hospital, Martinez
13. John Muir Memorial Hospital, Walnut Creek
14. Childrens Hospital, Oakland
15. Naval Regional Medical Center, Oakland
16. Institute of Forensic Science, Oakland
17. Alta Bates Hospital, Berkeley
18. Donner Pavilion, Berkeley
19. Highland Alameda General Hospital, Oakland
20. VA Ambulatory Clinic, Sacramento
21. San Joaquin General Hospital, French Camp
22. Merced Community Medical Center, Merced
23. Shasta General Hospital, Redding
24. Contra Costa County Medical Services, Martinez
25. Scenic General Hospital, Modesto
26. Mercy Hospital, Redding
27. Student Health Center, California State University, Sacramento
28. Student Health Center, University of California, Davis
29. Sacramento County Mental Health Clinics, Sacramento
30. Los Angeles General Hospital, Los Angeles
31. Letterman Army Medical Center, San Francisco
32. Sloan Kettering Cancer Institute, New York
33. Brook Army Medical Center, San Antonio, Texas
34. Napa State Hospital, Napa

IRVINE

1. University of California, Irvine, Medical Center
2. Memorial Hospital Medical Center, Long Beach
3. Veterans Administration Hospital, Long Beach
4. Childrens Hospital Of Orange County, Orange

5. St. Joseph Hospital, Orange
6. City of Hope Medical Center, Duarte
7. Kaiser Foundation Hospital, Bellflower
8. Fairview State Hospital, Costa Mesa
9. Metropolitan State Hospital, Norwalk
10. Rancho Los Amigos Hospital, Downey
11. St. Jude Hospital & Rehabilitation Center, Fullerton
12. Naval Regional Medical Center, Long Beach
13. Federal Correctional Institution, Terminal Island
14. N.L. Industries, Los Angeles
15. Clinica Sierra Vista, Lamont
16. California Institute for Men, Chino
17. Childrens Hospital, Los Angeles

LOS ANGELES

1. UCLA Hospital and Clinics
2. Bloomington-Fontana Clinic, San Bernardino County
3. Brawley Clinic, Imperial County
4. Children's Hospital, Los Angeles
5. City of Hope, Los Angeles
6. County-USC, Los Angeles
7. Colton Clinic, San Bernardino County
8. Edwards Air Force Base, Kern County
9. Kaiser Clinic, Los Angeles
10. Long Beach Memorial Hospital
11. Ontario Clinic, San Bernardino County
12. Orthopedic Hospital, Los Angeles
13. Oxnard Satellite Clinic, Ventura County
14. Pride House, Los Angeles
15. Rancho Los Amigos, Los Angeles
16. Rialto Robert Wood Johnson Clinic, San Bernardino County
17. Ross-Loos Clinic, Los Angeles
18. Shrine Hospital, Los Angeles
19. Simi Valley Satellite Clinic, Ventura County
20. UCLA Child Care Center
21. Venice Free Clinic
22. Women's Screening Clinic throughout Ventura County conducted on a regular basis
23. Preceptorships in Bakersfield, Eureka, Lancaster, Santa Rosa and Tehachapi

SAN DIEGO

1. University Hospital of San Diego County
2. Mercy Hospital and Medical Center
3. Kaiser Foundation Hospital
4. Southern California Permanente Medical Group

5. Tuba City Hospital
6. Donald N. Sharp Memorial Hospital
7. Children's Hospital and Health Center
8. Clinica de Salubridad de Campesinos, Brawley
9. Pioneers Memorial Hospital
10. Kern County Medical Center
11. Balboa Naval Hospital
12. Veterans Administration Hospital in San Diego
13. Linda Vista Community Health Care Center
14. Scripps Memorial Hospital

SAN FRANCISCO

1. Childrens Hospital and Adult Medical Center, San Francisco
2. Crippled Childrens Hospital, Phoenix
3. Childrens Hospital Medical Center of Northern California, Oakland
4. Community Hospital of Sonoma County, Santa Rosa
5. Elk — various clinics
6. Firebaugh-Mendota Health Center, Fresno-San Joaquin Valley
7. French Hospital, San Francisco
8. Fresno-Valley Medical Center
9. Fresno-San Joaquin Valley — various other clinics
10. Geyserville Clinic
11. Gualala — various clinics
12. Healdsburg — various clinics
13. Highland General Hospital, Oakland
14. Hollister — various clinics
15. Irwin Memorial Blood Bank, San Francisco
16. Kaiser Foundation Hospital, San Francisco
17. Kaiser Foundation Hospital, Honolulu
18. Kaiser Permanente Medical Center, Oakland
19. Kaiser Hospital, Redwood City
20. King City — various clinics
21. Letterman Army Medical Center, San Francisco
22. Langley Porter Neuropsychiatric Institute, San Francisco
23. Maricopa County Hospital, Phoenix
24. Mt. Zion Hospital and Medical Center, San Francisco
25. Monterey — various clinics
26. Natividad Medical Center, Salinas
27. Naval Regional Medical Center, Oakland (formerly Oak Knoll)
28. Occidental Health Center
29. Peninsula Hospital and Medical Center, Burlingame
30. United States Public Health Hospital, San Francisco
31. Pacific Medical Center, San Francisco (formerly Presbyterian Hospital)
32. Ralph K. Davies Medical Center, San Francisco (formerly Franklin Hospital)
33. Rancho Los Amigos Hospital, Downey
34. Russian River Health Center

35. Stanford Medical Center, Palo Alto
36. San Francisco General Hospital
37. San Francisco Medical Center (formerly SFGH)
38. Scenic General Hospital, Modesto
39. Shriners Hospital for Crippled Children, Honolulu
40. San Joaquin General Hospital, Stockton
41. Samuel Merritt Hospital, Oakland
42. Shriners Hospital for Crippled Children, San Francisco
43. Sonoma Community Hospital
44. St. Lukes Hospital, San Francisco
45. St. Marys Hospital and Medical Center, San Francisco
46. Ukiah -- various clinics
47. U.C. Hospital and Clinics, S.F. (includes UC, Moffitt & Ambulatory Care Center)
48. Veterans Administration Hospital, San Francisco
49. Veterans Administration Hospital, Fresno
50. Veterans Administration Hospital, Phoenix
51. Valley Medical Center of Fresno
52. Ft. Ord Army Hospital, Fort Ord

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CHAPTER II

NURSING EDUCATION

Of the five health fields examined in this Plan, perhaps nursing is the most unusual in terms of educational preparation. In the other fields--medicine, dentistry, optometry, and pharmacy--the law prescribes the licensing of the health professional after graduation from an educational program of specified length and content. In nursing, the law permits the licensing of the Registered Nurse (R.N.) after completion of one of three programs: two-year (associate degree, A.A.); three-year (diploma); or four-year (baccalaureate degree, B.S.). Even then, completion of one of these programs is not required for licensure; a category of "non-graduates" is allowed to take the license examination. In addition, another category of nurse, the Licensed Vocational Nurse (L.V.N.), is trained in one-year programs.

Furthermore, there is little agreement in the literature of health care about how the graduates of the three R.N. programs differ in professional competency and in their duties after licensure.

In addition to the confusion introduced by this multiple licensing system, other problems exist in analyzing the field of nursing because of the weaknesses in available data. It is difficult to obtain the same quantity and quality of data on the output and enrollment of the various nursing programs that are available in the other four health fields in this study. This is particularly true of the two- and three-year R.N. programs, and of the L.V.N. programs. The Higher Education General Information Survey (HEGIS) does not identify academic majors in two-year institutions; thus, enrollments in associate degree nursing programs are impossible to obtain from this source. Likewise, HEGIS does not provide information on the hospital-based three-year programs and their enrollments and outputs.

Further complicating its study is the fact that nursing is widely regarded, both from within and without, as a profession with serious problems of identity and morale.

A recent article in Hospitals, the journal of the American Hospital Association made the point effectively. Provocatively entitled, "Nursing Profession Undergoes Intensive Scrutiny and Adjustment," the article reported:

> A review of the 1976 nursing literature shows an overriding concern with the evolution, status, and role of nursing both as an entity in itself and within the structure of the hospital. This concern is expressed throughout the literature in many themes, such as the image of

> the nurse, the conflict over educational preparation, the control of nursing practice, the issues of accountability and responsibility, nurse autonomy, and the leadership of the nurse administrator as a change agent. This concern is echoed throughout the hierarchy of nursing, from staff nurse to nurse manager, to nurse administrator, nurse practitioner and nurse clinician.

Although not enumerated in this article, some of the present controversies in nursing include:

1. Educational Preparation

   Considerable pressure exists to eliminate the present occupational title of Registered Nurse, and to move instead to two categories: a professional nurse, one who has had graduate/professional education; and a technical nurse, one who corresponds to the present L.V.N. and associate degree nurse.

2. The Nature of Nursing

   Consistent with a higher level of professionalism, pressure exists to move nursing into the category of a scientific discipline rather than the behavioral field it is so frequently identified as being.

3. Patient Care

   Strong philosophical crosscurrents exist in patient care; e.g., one group of nurses wants to be relieved of the menial tasks in nursing, while another group--those with a holistic point of view called primary care nursing--want to be assigned all aspects of patient care, including menial tasks.

There are other controversies between those who have a behavioral view of nursing and those who have a physiological view--those concerned with "care" versus those concerned with "cure."

While nursing educators point out that progress is being made within the profession on resolving these issues, the problems remain more visible than the progress. Thus, examining nursing education is a challenging assignment.

ADEQUACY OF PROGRAM SIZE

In its Health Manpower Plan, the Department of Health devotes relatively little attention to nursing, but does offer two findings:

1) Because of the lack of accepted ratios for the proper number of nurses per unit of population, it is impossible to know how many nurses we need.

2) The supply of nurses continues to grow rapidly in California, and will probably continue to exceed anticipated demand, although there may be some local shortages.

These findings give rise to a single recommendation:

> State initiatives to increase the overall supply of nursing personnel should be specifically targeted toward such goals as increasing the supply in underserved areas; increasing the number of ambulatory care nurse practitioners, especially family nurse practitioners; increasing the number of needed nurse specialists, such as geriatric nurses; and increasing the number of nurses who can work effectively among bilingual and multicultural populations.

This recommendation, similar to earlier ones on medicine in the Health Manpower Plan, speaks of any increases in supply being "specifically targeted" toward special needs. Meeting such needs in nursing, however, may be even more difficult than in medicine. Perhaps in educating nurses for expanded roles, or in educating bilingual nurses, or in setting up education programs in underserved areas, such "targeting" might be possible. However, the ambiguity and lack of legal status of nurse practitioners--as discussed in the chapter on medicine--can place limitations on the expanded use of these health professionals. An even greater limitation is the fact that, for the most part, a nurse cannot decide unilaterally to move to an underserved area as can a physician. Since the nurse generally depends upon the existence of a hospital for work, he or she can only work where there are hospitals with vacancies--even though real needs for health care may exist elsewhere. Thus, to "target" nursing education toward areas of unmet need is no assurance by itself that the need will be met.

The impact of such a recommendation--to increase enrollments selectively--can be appreciated only after examining information on the number of graduates and the enrollment levels of nursing education programs in California.

Output of California Nursing Programs

The total number of R.N. programs, their total output, and their rate of growth are apparent from Table N-1.

TABLE N-1

Output of R.N. Education Programs in California

Year	Total Number Programs	Total Number Graduates	B.S. Programs	B.S. Graduates	A.A. Programs	A.A. Graduates	Diploma Programs	Diploma Graduates
1964	66	1,579	16	340	30	647	20	592
1965	65	1,814	15	401	32	834	18	579
1966	69	1,938	16	473	35	864	18	598
1967	65	2,103	15	594	32	950	18	559
1968	67	2,318	16	583	35	1,179	16	556
1969	68	2,626	15	643	38	1,395	15	588
1970	NA	3,071	NA	791	NA	1,775	NA	505
1971	83	3,302	16	914	57	1,896	10	492
1972	79	3,895	16	1,015	53	2,386	10	491
1973	78	3,939	17	1,018	55	2,552	6	369
1974	82	4,523	18	1,253	58	2,886	6	384
1975	84	4,885	19	1,385	60	3,126	5	374
1976	83	5,193	19	1,548	60	3,344	4	371
1977	83	5,226	19	1,417	62	3,534	4	275
1978	83	5,125	19	1,388	63	3,482	4	255

Source: Board of Registered Nursing; The John Wong Report.

It is evident from Table N-1 that considerable growth has taken place in nursing programs in the State. Only diploma programs have declined in number and output. In the past decade, the output of B.S. programs has increased 137 percent and the output of A.A. programs has increased 272 percent. For all programs combined, the total output increased 149 percent during this period.

Additional details follow, by institution, on the number of nursing graduates produced in each type of program. Table N-2 displays the output of baccalaureate programs which lead to licensure.

In the public sector of higher education, the growth in output of B.S.-degree nursing programs, seems to have leveled off during the last several years. Growth continues in the private institutions, but it also shows signs of slowing down.

093

TABLE N-2

Number of Graduates of B.S. Degree Nursing Programs

Institution	1972	1973	1974	1975	1976	1977	1978
UCLA	40	49	38	43	81	48	51
UCSF	67	90	79	182	132	140	140
Total, UC	107	139	117	225	213	188	191
CSC, Bakersfield	-	57	62	38	46	55	77
CSU, Chico	61	70	89	92	91	78	107
CSU, Fresno	95	129	105	128	114	110	125
CSU, Hayward	-	20	55	87	65	73	62
Humboldt State U.	14	21	22	39	29	34	33
CSU, Long Beach	61	74	72	83	92	105	132
CSU, Los Angeles	141	146	233	178	161	94	199
CSU, Sacramento	49	47	76	59	100	74	141
CSU, San Diego	105	84	79	84	95	87	97
San Francisco State U.	81	57	56	80	70	63	84
San Jose State U.	97	119	130	114	129	110	106
Total, CSUC	704	767	979	982	992	883	1,163
Azusa Pacific	-	-	-	-	-	*	28
Biola	22	20	28	29	39	44	57
Loma Linda	66	46	74	83	77	81	76
Mt. St. Mary's	34	45	63	73	73	68	58
Pt. Loma	-	-	31	28	35	33	39
Stanford	26	18	18	-	-	-	-
U. of San Francisco	79	90	105	110	119	120	129
Total, Private Institutions	227	219	319	323	343	346	377

Source: HEGIS; UC Statistical Summary; CSUC Statistical Reports.

*Azusa Pacific reported no graduates to HEGIS for 1976-77, but the institution reported 23 graduates in May of 1977 to the Board of Registered Nursing.

Note: The CSU totals for Long Beach and Los Angeles include graduates who already have been licensed as R.N.s. CSUC nursing schools reported different totals for these seven years to the Board of Registered Nursing: 677, 717, 826, 875, 992, 883, 821.

Table N-3 summarizes the degrees conferred since 1972 in associate degree programs in the Community Colleges, and in the three four-year institutions which have such programs.

The growth in output of associate degree programs has been extremely rapid. In five years' time it has risen 45 percent in the Community Colleges, and a spectacular 123 percent in the private four-year institutions.

TABLE N-3

Associate Degree Nursing Programs
Degrees Conferred by Community Colleges

School	1972	1973	1974	1975	1976	1977	1978
American River	26	37	33	33	35	28	35
Antelope Valley	36	34	35	28	31	40	33
Bakersfield	33	42	38	47	58	42	32
Cabrillo	35	25	24	36	33	35	34
Cerritos	42	53	49	71	78	86	71
Chabot	38	48	46	40	50	49	44
Chaffey	43	52	50	50	29	72	69
C.C. of San Francisco	51	42	69	87	81	80	88
College of the Desert	46	40	34	51	65	38	90
College of Marin	44	40	40	33	51	47	42
College of the Redwoods	14	23	22	28	30	28	42
College of San Mateo	41	40	50	35	45	49	37
College of the Sequoias	39	29	27	32	30	29	29
Compton College	32	52	51	63	46	46	42
Contra Costa	96	85	75	79	70	74	64
Cuesta	25	26	26	22	25	25	26
Cypress	62	67	77	77	78	76	85
De Anza	47	56	54	55	33	45	34
East Los Angeles	48	49	66	64	92	45	79
El Camino	69	51	60	71	84	77	75
Fresno City College	45	49	43	49	54	72	70
Golden West	57	69	64	84	93	108	84
Grossmont	42	40	40	47	46	50	49
Hartnell	25	22	23	26	24	27	25
Imperial Valley	-	30	26	23	32	24	24
Long Beach City College	72	89	82	102	119	129	115
L.A. City College	79	81	110	75	95	95	68
L.A. Harbor College	40	61	77	51	67	60	68
L.A. Pierce	50	30	60	74	71	75	81
L.A. Southwest	51	41	47	56	53	82	64
L.A. Trade-Technical	72	67	64	64	62	84	92
L.A. Valley	90	108	110	130	158	138	160
Los Medanos	-	-	-	-	16	20	19
Merritt College	52	43	49	46	49	50	52
Modesto J.C.	32	43	57	42	38	105	51
Mt. San Antonio	25	35	42	43	41	48	46
Napa	31	29	46	50	47	33	39
Ohlone	-	-	32	37	30	39	36
Palomar	27	31	61	37	65	49	56
Pasadena City College	78	83	101	154	126	121	99
Rio Hondo	46	50	47	65	64	84	82
Riverside City College	54	61	71	71	81	93	88
Sacramento City College	44	46	41	44	55	55	63
Saddleback	-	36	38	63	67	54	83
San Bernardino Valley	41	45	45	49	51	57	57
San Diego City	31	27	29	28	30	28	29
San Joaquin Delta	60	48	49	57	67	60	61
San Jose C.C. - Evergreen Valley	58	54	51	54	50	63	48
Santa Ana	-	-	29	30	54	53	58
Santa Barbara C.C.	24	32	37	36	14	37	22
Santa Monica C.C.	36	42	54	59	60	65	57
Santa Rosa C.C.	21	25	36	44	52	48	44
Shasta	23	23	29	33	31	35	29
Solano	34	39	29	36	37	36	34
Southwestern	32	29	32	33	33	37	33
Ventura	51	42	52	39	53	49	64
Victor Valley	-	-	-	-	-	28	28
Totals	2,290	2,451	2,729	2,933	3,129	3,320	3,482

Source: Nursing Board.

TABLE N-3a

Associate Degree Nursing Programs
Degrees Conferred in Four-Year Institutions

School	1972	1973	1974	1975	1976	1977	1978
Loma Linda	24	24	40	54	64	61	85
Mt. St. Mary's	-	-	34	36	32	46	69
Pacific Union	72	78	83	103	119	107	99
Total, 4-year Institutions	96	102	157	193	215	214	253

Source: Nursing Board.

The third type of nursing program is the hospital-based diploma program. Table N-4 contains a summary of the diplomas awarded since 1972 by hospitals operating these programs.

TABLE N-4

Number of Graduates, Diploma Nursing Programs

Institution	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
CONTINUING PROGRAMS							
St. Luke's	37	34	34	45	40	41	39
Calif. Hospital Medical Ctr.	24	23	30	40	42	35	40
L.A. County Medical Ctr.	162	177	175	163	229	120	126
Samuel Merritt	57	48	65	70	60	79	50
Total	280	282	304	318	371	275	255
DISCONTINUED PROGRAMS							
Kaiser	46	45	45	56	-	-	-
San Jose Hospital	30	42	35	-	-	-	-
St. Vincent's	36	54	-	-	-	-	-
Hollywood Presbyterian	39	-	-	-	-	-	-
Queen of Angels	38	-	-	-	-	-	-
St. Joseph's	22	-	-	-	-	-	-
Total	211	151	80	56	-	-	-
Total, All Programs	491	433	384	374	371	275	255

Source: Nursing Board; Individual Hospitals.

The declining role of the diploma nursing programs is readily apparent.

The reasons for this decline are not completely clear, but appear to include:

1. Increasing identification of nursing as a field of higher education; e.g., the declaration to this effect by the American Nurse's Association in the mid-1960s;

2. Practical problems for the hospital-based training programs in teaching certain required subjects, forcing hospitals into dependence on higher education institutions for some of their instruction;

3. Fiscal pressures, as costs imposed by the training programs could not be passed on to third-party payment agencies, absorbed by the hospital, or passed on to student nurses; and

4. Competition from Community College programs which are shorter than diploma programs, offer academic credit, and are tuition free.

In addition to the baccalaureate and associate degree programs leading to licensure and the diploma programs leading to licensure, there are a number of graduate nursing programs in California. The graduate degrees awarded through these programs since 1972 are summarized in Table N-5.

TABLE N-5

Graduate Degrees Awarded in Nursing

Institution	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
MASTERS DEGREE PROGRAMS						
CSU, Chico	1	4	8	6	8	8
CSU, Fresno	16	12	18	14	5	11
CSU, Los Angeles	24	40	46	29	39	26
San Jose State U.	14	9	12	15	19	12
CSU, Long Beach	-	-	-	-	-	8
Total, CSUC	55	65	84	64	71	65
UCLA	59	75	89	69	83	105
UCSF	137	153	51	149	155	134
Total, UC	196	228	140	218	238	239
Loma Linda	19	17	15	22	31	19
DOCTORS DEGREE PROGRAMS						
UCSF	2	7	4	3	2	8

Source: CSUC Statistical Reports; UC Statistical Summary; HEGIS.

No significant growth is apparent in graduate programs in nursing. This situation seems to suggest that the growth of graduate programs characteristic of many disciplines is not occurring in nursing in this State. The University of California, however, maintains an emphasis on professional and graduate programs; its output of graduate degrees in nursing exceeds its output of undergraduate degrees in the same field.

Some interesting comparisons can now be made by examining the enrollments of the various nursing programs.

Enrollment in Nursing Programs

Enrollments in the three types of R.N. programs are reported in the next set of tables. Table N-6 shows the enrollment in programs leading to the B.S. degree and licensure.

TABLE N-6

Enrollments in B.S. Nursing Programs

Institution	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
UCLA	102	88	95	92	123	98	97
UCSF	311	319	336	269	287	293	281
Total, UC	413	408	431	361	410	381	378
CSC, Bakersfield	160	168	118	105	66	87	95
CSU, Chico	490	499	274	254	227	221	228
CSU, Fresno	437	302	439	491	319	275	220
CSU, Hayward	284	302	120	195	140	122	213
Humboldt State U.	193	197	167	146	104	125	120
CSU, Long Beach	488	456	488	578	414	372	470*
CSU, Los Angeles	818	646	723	784	659	609	194*
CSU, Sacramento	517	496	313	337	193	390	133
CSU, San Diego	543	423	279	310	285	286	247
San Francisco State U.	254	306	325	347	218	250	373
San Jose State U.	489	506	442	443	296	236	485
Total, CSUC	4,683	4,301	3,688	3,990	2,921	2,973	2,778
Azusa Pacific	-	-	29	NA	94	64	96
Biola	172	210	178	141	353	180	198
Loma Linda	114	265	279	255	254	372	311
Mt. St. Mary's	100	112	118	120	124	129	135
Point Loma	52	57	67	111	259	263	122
Stanford	39	18	-	-	-	-	-
U. of San Francisco	294	328	365	363	391	403	599
Total, Private Institutions	771	990	1,036	—	1,495	1,411	1,461

*These institutions also have degree-completion programs for R.N.s, the students of which are included in these totals.

Source: For public institutions: HEGIS; UC Statistical Summary; CSUC Statistical Reports
For private institutions: HEGIS; Board of Registered Nursing.

One of the more interesting observations thus far in this Plan can be made from Table N-6: the apparent lack of correlation between trends in enrollment and output. Enrollment in State University nursing programs during the past five years has declined by 37 percent while, according to Table N-2 the number of graduates has increased by 65 percent. Similarly, enrollment in the University's undergraduate nursing program has declined over the past five years by 7.8 percent, but the number of graduates has increased by 75.7 percent. There are a number of instances throughout this chapter in which nursing enrollments and the number of graduates seem to be moving on separate cycles; the data suggests no explanation of this phenomenon.

Enrollments in associate degree nursing programs are shown in Table N-7.

TABLE N-7

Associate Degree Nursing Programs
Fall Enrollments

School	1972	1973	1974	1975	1976	1977	1978
American River	74	68	73	68	67	75	76
Antelope Valley	86	69	68	72	79	77	82
Bakersfield	70	86	91	84	72	92	114
Cabrillo	66	66	36	72	74	72	75
Cerritos	126	132	152	175	172	147	157
Chabot	90	92	64	99	90	87	89
Chaffey	99	105	76	110	144	148	142
C.C. of San Francisco	145	145	147	172	175	186	174
College of the Desert	100	115	126	135	143	145	146
College of Marin	99	103	98	106	103	103	93
College of the Redwoods	54	55	65	63	65	66	66
College of San Mateo	143	119	121	127	121	105	115
College of the Sequoias	67	65	65	65	65	77	82
Compton College	115	121	136	135	132	124	116
Contra Costa	166	159	166	161	171	145	128
Cuesta	52	50	50	52	51	53	53
Cypress	153	169	165	168	172	151	141
De Anza	121	116	100	108	107	111	105
East Los Angeles	124	137	185	194	184	196	180
El Camino	118	138	155	153	152	152	170
Fresno City College	113	117	113	116	143	137	144
Golden West	150	153	179	196	220	208	213
Grossmont	88	102	101	100	107	105	105
Hartnell	58	58	65	62	62	61	56
Imperial Valley	69	64	67	72	71	88	78
Long Beach City College	197	198	221	245	257	239	256
L.A. City College	233	259	240	200	174	175	150
L.A. Harbor College	156	169	161	167	166	168	160
L.A. Pierce	110	145	162	166	173	173	169
L.A. Southwest	125	163	131	193	118	206	209
L.A. Trade-Technical	67	66	64	311	311	102	99
L.A. Valley	232	247	275	306	268	295	289
Los Medanos	-	-	20	38	65	41	44
Merritt College	93	96	95	99	105	105	107
Modesto J.C.	129	174	161	134	185	137	176

TABLE N-7

Associate Degree Nursing Programs
Fall Enrollments
(Continued)

School	1972	1973	1974	1975	1976	1977	1978
Mt. San Antonio	100	109	103	115	101	110	129
Napa	94	110	112	96	95	89	97
Ohlone	40	85	80	76	81	77	70
Palomar	89	107	99	117	119	132	147
Pasadena City College	180	252	264	243	255	218	236
Rio Hondo	110	126	142	148	173	175	181
Riverside City College	175	185	185	191	201	197	184
Sacramento City College	116	115	118	132	133	129	121
Saddleback	82	107	127	103	124	194	151
San Bernardino Valley	98	103	116	110	116	117	122
San Diego City	27	30	29	30	33	32	39
San Joaquin Delta	110	113	123	127	125	133	129
San Jose C.C. - Evergreen Valley	134	134	135	147	164	143	159
Santa Ana	-	30	30	30	55	59	47
Santa Barbara C.C.	78	83	83	91	74	82	102
Santa Monica C.C.	96	106	112	115	115	122	121
Santa Rosa C.C.	83	84	96	104	99	97	99
Shasta	59	66	69	66	73	70	74
Sierra	-	-	-	-	-	-	19
Solano	87	78	91	48	87	81	83
Southwestern	73	77	79	77	77	79	74
Ventura	99	98	95	123	120	131	165
Victor Valley	-	-	-	33	58	70	72
Totals	5,820	6,319	6,482	7,098	7,242	7,089	7,180

Source: Nursing Board.

TABLE N-7a

Associate Degree Nursing Programs
Fall Enrollments in 4-Year Institutions

Institution	1972	1973	1974	1975	1976	1977	1978
Loma Linda	94	114	148	169	167	85	79
Mt. St. Mary's	39	94	91	96	124	139	137
Pacific Union	146	171	164	182	182	164	168
Total, 4-Year	279	379	403	447	473	388	384

Table N-7 provides another example of a different (slower) rate of growth in nursing enrollments than in the number of graduates.

Table N-8 shows the enrollment trend for diploma programs, the only nursing programs which are declining in numbers and enrollments.

TABLE N-8

Fall Enrollments, Diploma Nursing Programs

Institution	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
CONTINUING PROGRAMS							
St. Luke's	126	133	139	137	132	126	136
Calif. Hospital Medical Ctr.	143	143	151	151	166	166	140
L.A. County Medical Ctr.	453	479	405	375	260	324	365
Samuel Merritt	186	208	205	216	277	160	189
Total	908	913	900	879	835	776	830
DISCONTINUED PROGRAMS							
Kaiser	184	162	112	57	-	-	-
San Jose Hospital	164	80	39	-	-	-	-
St. Vincent's	81	82	-	-	-	-	-
Hollywood Presbyterian	142	-	-	-	-	-	-
Queen of Angels	49	-	-	-	-	-	-
St. Joseph's	29	-	-	-	-	-	-
Total	649	324	151	57	-	-	-
Total, All Programs	1,557	1,237	1,051	936	835	776	830

Source: Nursing Board; Individual Hospitals.

The number of diploma programs in nursing has shrunk from ten to four in five years' time (from an all-time high of 134), and even the surviving programs generally are losing enrollments.

Graduate enrollments in nursing are reported in Table N-9. No data are available for Loma Linda University, since HEGIS does not identify nursing as a graduate field and since the Board of Registered Nurses does not keep track of data on graduate programs.

Table N-9 shows the growth which has occurred in graduate nursing enrollments in the two public segments of higher education, although in each case a single institution (UCSF, CSULA) is responsible for the bulk of that growth.

TABLE N-9

Enrollment in Graduate Programs in Nursing

Institution	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
UCLA	164	167	155	193	197	156
UCSF	207	208	234	303	320	346
UCD (Nurse Practitioner)	32	40	78	77	71	28
Total, UC	403	415	467	573	588	530
CSU, Chico	24	11	15	21	17	17
CSU, Fresno	44	38	37	51	53	47
CSU, Long Beach	-	-	-	-	-	47
CSU, Los Angeles	73	104	99	174	183	173
San Jose State U.	51	58	59	55	61	62
Total, CSUC	192	211	210	301	314	346
Loma Linda	NA	NA	NA	NA	NA	NA

In addition to the programs which provide initial nursing education and those which provide graduate education in nursing (some of which are in clinical specialties) there are a number of other programs which provide training in nursing specialties. These programs vary considerably in structure and formality, but they have a common feature in that no educational or licensure agency keeps track of the number of people in training or completing each program.

Other than the graduate programs, the most structured programs are those for nurse practitioners, nurse midwives, and nurse anesthetists. All of these specialties, which are discussed in the section of this Plan on mid-level practitioners in medicine, have some form of meaningful national certification. In most other specialties in nursing, the training historically has been acquired on the job in a less formal program, and certification or other forms of credentialing generally has not existed. Among these specialties are those concerned with surgery, obstetrics, critical care, oncology, orthopedics, pediatrics, et al. It is possible that the lack of formal training programs and credentials in these fields has served as a depressant on salaries for nurses who specialize.

MID-LEVEL PRACTITIONERS: THE L.V.N.

In nursing the Registered Nurse is supplemented by a category of mid-level practitioner, the Licensed Vocational Nurse, or L.V.N. In other states, nurses in this category are commonly identified as Licensed Practical Nurses.

The licensing of L.V.N.s in California is carried out by an agency separate from that for registered nursing. That agency is the Board of Vocational Nurse and Psychiatric Technician Examiners in the Department of Consumer Affairs.

Training for L.V.N.s is provided through year-long programs at ninety-four schools accredited by the Board. Fundamental differences between the training of L.V.N.s and the education of R.N.s are immediately apparent when one examines the diversity and nature of the schools which train L.V.N.s. Although almost two-thirds of these programs (sixty-three to be exact) are in Community Colleges; eleven are a part of adult schools operated by secondary or unified school districts, and another eleven are in private vocational schools. Two are located in hospitals (one Kaiser hospital and two military hospitals); three in community skills centers; two in private non-profit institutions; and one each in a regional occupational center and in a joint adult school/Community College center. To be licensed upon completion of an L.V.N. program, the graduate must have the equivalent of a tenth-grade education.

These L.V.N. training programs have produced the following numbers of graduates:

1972-73	3,487
1973-74	3,443
1974-75	3,353
1975-76	3,499
1976-77	3,147
1977-78	2,816

Source: L.V.N. Board

Because L.V.N. programs are not degree oriented, they are not reported through HEGIS. In addition, the Board of Vocational Nurse and Psychiatric Technician Examiners has a very limited information capability. For these reasons it is difficult to obtain useful information on enrollment and output of the various programs, or any data suggesting current trends.

Nationally in 1975 there were 1,315 training programs for L.V.N.s or their equivalent, with 45,375 graduates. It appears that California is not graduating as many L.V.N.s as its population would warrant. Nevertheless, the supply of L.V.N.s appears to be reasonably adequate, even though no optimum ratio for this health occupation has been established.

Historically, there have been several circumstances which affect the utilization of L.V.N.s in health care:

- L.V.N.s tend to be older and from somewhat lower economic levels than R.N.s;
- L.V.N. salaries are lower than those for R.N.s;
- L.V.N.s have less mobility than R.N.s because of family and economic circumstances;
- There is less attrition for L.V.N.s than for R.N.s; dropping out of the labor force is a luxury the former cannot afford;
- There is less in-migration of L.V.N.s than of R.N.s.

Source: The John Wong Report.

The existence of the L.V.N. probably serves as a depressant on the R.N.s' economic situation, inasmuch as hospitals can substitute L.V.N.s for R.N.s in a number of instances. To the L.V.N. this can mean a good opportunity to work, but not a good salary for which to work.

Upward mobility is possible, however, since career ladders operate to permit L.V.N.s to become R.N.s. An increasing number of associate degree nursing programs in the Community Colleges are designed solely for L.V.N.s who wish to become R.N.s. From an educational view, this articulation is not without problems, commendable as it may be. The academic attainment of some L.V.N.s who enter R.N. programs as second-year students may be open to question, inasmuch as L.V.N. programs are frequently noncollegiate in level, operate in such settings as high schools and trade schools, and grant considerable credit for experience at relatively unskilled levels of employment. Consequently, career-ladder programs for L.V.N.s may be open to some criticism regarding their academic level and integrity.

ARTICULATION

Articulation, as that term is used in California higher education circles, is the facilitation of movement of students from one level of education to a more advanced level with a minimum of disruption, frustration, and repetition of coursework. In a broader sense, articulation also implies the facilitation of career ladders, of upward mobility within a profession.

In nursing education, formal articulation activities occur at several points. First are the L.V.N. programs. California's Business and Professions Code requires that all L.V.N. training programs shall give students credit for knowledge previously acquired, and that failure to do so will subject the school to denial of accreditation by the Board of Vocational Nurse Examiners. The Board is given power to prescribe by regulation the

> . . . education for which credit is to be given and the amount of credit which is to be given for each type of education including the amount of credit to be given to a certified nurse assistant and to a nurse assistant who had provided direct nursing services in health facilities.

Similar provisions direct the Board of Registered Nursing to require that institutions grant credit for previously acquired knowledge, under threat of loss of accreditation, and to prescribe how much credit should be awarded for various kinds of education. The Board is also called upon to evaluate and assign credit to the training received by medical corpsmen in the Armed Forces; to require no more than thirty units in nursing and related science subjects for L.V.N.s to be licensed as R.N.s; and to insure, under threat of loss of accreditation, that Community Colleges do not discriminate against L.V.N.s seeking admission solely because they are planning to acquire the thirty units needed to become a R.N.

Thus, there are singularly strong and comprehensive statutory requirements for articulation in the education of nurses. There is, however, apparently no data available on how many people benefit from such procedures annually in each educational program.

Much of the day-to-day work in articulating nursing programs is handled by the Articulation Council of California. Through a series of committees, including one in nursing and one in allied health, faculty members from various institutions and segments of postsecondary education meet to identify problems of articulation, exchange information and points of view, and develop and recommend methods for improving the articulation process. In recent years, the nursing committee's efforts have been focused on implementing the statute which mandates that all nursing requirements be completed within the first three years of a baccalaureate program. Other on-going concerns of the committee include transfer problems, counseling of high school students, adequacy of clinical facilities, credentialing of school nurses, accreditation, admission requirements, development of tracks in nursing education, progression from L.V.N. to R.N., etc.

Additional attention to articulation problems is provided through ad hoc efforts such as the Health Career Ladder Project, a special program launched by the Governor through the Department of Consumer Affairs to facilitate career ladders in the health professions by identifying and removing barriers to upward mobility. However, resentment toward the program has developed among nursing educators, who perceive the approach taken by the Health Career Ladder Project to be hostile to formal nursing education.

There is also considerable activity on some campuses to encourage articulation for associate degree nurses who wish to earn baccalaureate degrees in nursing. Such programs are a recent phenomenon. Table N-10 (page 17) shows the number of graduates of these programs, and Table N-11 (page 17) shows enrollments.

TABLE N-10

Number of Graduates of B.S. Programs for Previously Licensed Nurses

Institution	1972	1973	1974	1975	1976	1977
CSU, Fullerton	-	-	-	-	11	28
CSC, San Bernardino	-	-	-	-	33	24
Sonoma State U.	-	-	37	56	78	72
CSC, Stanislaus	-	-	-	-	-	-
Total, CSUC			37	56	122	124
Holy Names	-	-	-	-	4	7
La Verne	-	-	-	-		
Univ. of San Diego	5	NA	5	3	12	24
California Lutheran	-	-	-	-	-	-
Total, Priv. Inst.	5		5	3	16	31

Source: HEGIS; Supplemented by data from CSUC Chancellor's Office.

TABLE N-11

Enrollment in B.S. Programs for Previously Licensed Nurses

Institution	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
CSU, Fullerton	-	-	36	141	237	288
CSC, San Bernardino	-	79	120	106	110	101
Sonoma State U.	47	119	165	195	210	227
CSC, Stanislaus	-	-	-	-	-	57
Total, CSUC	47	198	321	442	557	673
Holy Names	-	-	-	-	4	7
La Verne	-	-	-	-	-	-
Univ. of San Diego	79	90	105	110	119	120
California Lutheran	-	-	-	-	-	-
Total, Priv. Inst.	79	90	105	110	123	127

Source: HEGIS; Supplemented by data from CSUC Chancellor's Office.

The first such program in the University of California is planned to open at the San Francisco campus in the fall of 1980 in conjunction with a shift to a sequential B.S./M.S. program and the elimination of the terminal B.S. program.

Another program which facilitates articulation is the Proficiency Examination Program of the American College Testing Program (ACT).

For several years it has been possible for students to earn the equivalent of an academic degree in nursing (up to 74 semester hours) from the University of the State of New York by means of a series of examinations in nursing. Several hundred Californians, including a number of L.V.N.s, have participated in this program, including going to New York for a two-day clinical examination, in order to earn a nursing degree and ultimately become a registered nurse.

Viewing articulation in the broader sense of upward career mobility, one can conclude that opportunities for advancement for R.N.s are reasonably good. Supervisory, administrative, specialist, and teaching positions all offer higher levels of responsibility and salary for the nurse who seeks advancement. Nursing salaries in California are among the best in the country. Entry-level salaries here range from $1,000 to $1,100 per month. In the University of California hospitals R.N.s make from $1,015 to $2,031 a month as clinical nurses, from $1,275 to $2,340 a month as administrative nurses, from $1,644 to $1,983 a month as senior nurse anesthetists, and from $2,133 to $3,183 as an associate director of nursing services. In State Civil Service these are representative salary ranges: R.N.s, $1,100 to $1,556; Nursing Coordinators, $1,556 to $1,876; Nursing Consultants, $1,485 to $2,160; Public Health Nurses, $1,235 to $1,967; and Nursing Education Consultants, $1,790 to $2,160.

However, the rapid turnover of nurses tends to prevent many nurses from reaching these higher salary levels. According to a recent survey by the California Hospital Association, almost 50 percent of the nurses working in hospitals have been hired within a year. This same survey showed the median salary paid to nurses in California hospitals to be $56.18 a shift, or roughly $1,175 a month, not much above an entry-level salary. As will be noted shortly in a discussion of attrition in the nursing work force, the prospect of higher salaries may not be enough to keep many nurses working for extended periods.

EDUCATIONAL OPPORTUNITY

Generally speaking, educational opportunity in the field of nursing is limited, due to the competition for available seats in nursing programs, although perhaps not as much as in medicine.

The only reliable data available concerning admissions are for two recent years in the nursing programs of the University of California. The success of applicants in gaining admission to these two programs is indicated in Table N-12 on the following page. (Because of duplicate applications, a somewhat higher percentage of applicants is probably being admitted.)

TABLE N-12

Admission Ratios in UC Nursing Programs

Program	No. of Applicants	No. Admitted	Ratio, Admissions/Applications
UCLA			
1975	266	50	18.8%
1977	252	50	19.8
UCSF			
1975	863	140	16.2%
1977	881	139	15.8

Source: UC Health Sciences.

In the absence of comparable data, one can only infer how competitive the admissions process is for the other segments of nursing education. Knowledgeable sources have estimated that one in five or one in six are common acceptance ratios. Thus, one could say, albeit tentatively, that admission into nursing programs is competitive in terms of the number of applicants versus the number of available spaces. In some Community Colleges, there are no competitive admissions standards because of the "open door" philosophy; in these settings, waiting lists and even lotteries are used in lieu of selective admissions.

CALIFORNIA'S NURSING WORK FORCE

Although information is lacking on the nature of nursing programs entrants, there is much data available on the nature of the graduates. An understanding of the nursing work force may be helpful in attempting to assess the outcomes of the educational programs in this field. The following information is from a 1975 survey of nurses in California conducted by the Department of Health, the report of which is entitled, Functional Task Analysis Study.

While not identified as such, the information might be considered a profile of the nursing work force in California.

Number of Nurses Licensed

The first element of the profile is the total number of nurses currently licensed to practice in California. Table N-13 contains that figure, along with the number of licensees who are living in California, in other states, and outside the United States.

TABLE N-13

Nurses Currently Licensed in California By Place of Residence January 1, 1975

PLACE OF RESIDENCE	NUMBER	PERCENT
Total	164,000	100.0
California	131,841	80.4
Other states	30,021	18.3
Outside U. S.	2,065	1.3
Unknown	73	*

* Less than 0.05 percent.

Note: Place of residence as reported to the Board.

It is significant that almost one-fifth of the nurses licensed in California do not reside here. In fact, it is possible that many of these nurses have never lived in California inasmuch as they can be licensed through reciprocity agreements with other states.

Number of Employed Nurses

Another key element of the profile is the number of nurses who are currently licensed and employed. Table N-14 displays this information, by location of employment.

TABLE N-14

Employed[1] Nurses Currently Licensed in California
By Place of Employment
January 1, 1975

PLACE OF EMPLOYMENT	NUMBER	PERCENT
Total	116,169	100.0
California	91,149	78.5
Unknown, resides in California	3,224	2.8
Other states	19,100	16.4
Outside U. S.	1,706	1.5
Unknown, resides outside California	991	0.9

[1] Includes nurses temporarily unemployed less then six months.

Note: Place of employment as reported on questionnaire.

Percents are rounded independently and may not add to total.

Of the 164,000 nurses licensed to practice in California, 116,169 (70.8 percent) are employed, as Table N-14 shows. However, only 91,149 of the those nurses are employed in California. This means that only 55.6 percent of the total number of State-licensed nurses are working here and only 69.1 percent of the total number of those both licensed and living in California are working.

Ethnicity of Nurses

Ethnicity is one of a number of component variables of the nursing work force which can be examined independently. Table N-15 indicates that percentage of nurses, by ethnic origin, who reported that they worked full time.

Apparently, nurses who are White, Japanese, and Chinese do not work full time as much as those from ethnic groups which are not as high on the socioeconomic ladder: Mexican-Americans, Blacks, American Indians, and Filipinos.

TABLE N-15

Percent of Nurses Employed[1] in California Who Work Full Time, By Ethnic Origin January 1, 1975

ETHNIC ORIGIN	WORK FULL TIME
	PERCENT
Total	72.5
White	70.1
Mexican-American	84.0
Black	86.5
American Indian	79.0
Japanese	76.1
Chinese	76.1
Filipino	92.7
Other	88.8
Unknown	73.3

[1] Includes nurses temporarily unemployed less than six months.

Another view of the relationship of ethnicity to the nursing work force can be obtained from Table N-16, which examines the total number of nurses licensed and the number working, by ethnicity.

TABLE N-16

Ethnicity of Nurses Licensed in California

Ethnic Group	Number Licensed	Percentage of Total	Number Working	Percentage of Working Nurses
White	143,441	86.5	99,029	69.5
Mexican American	1,356	.8	1,174	80.5
Black	4,515	2.8	3,931	82.3
American Indian	403	.2	339	79.7
Japanese	2,117	1.3	1,599	72.9
Chinese	1,195	.7	966	77.2
Filipino	7,319	4.5	6,767	88.7
Other	1,607	1.0	1,430	86.1
Unknown	2,047	1.2	934	65.8
Total	164,000	100.0	116,169	70.8

While this table bears out the fact that minority nurses do work actively in the profession, it also suggests how few of the licensed nurses are members of ethnic minorities, particularly when compared to the population of each minority in California. For example, only .8 percent of the nurses licensed in the State are Mexican-American, compared to a population in which 15.8 percent of the population is identified as Hispanic.[1] Blacks have slightly higher representation in nursing: 2.7 percent of the licensed nurses are Black, compared to 7.7 percent of the State's Black population.

Nursing Work Patterns

Another variable in nursing personnel is work patterns, particularly as they relate to educational background and age. Table N-17 shows the percentage of employed nurses who reported that they work full time, by highest degree held.

TABLE N-17

Percent of Nurses Employed[1] in California
Who Work Full Time, by Highest Degree Held
January 1, 1975

HIGHEST DEGREE	WORK FULL TIME
	PERCENT
Total	72.5
Associate degree	76.3
Hospital school diploma	66.6
Baccalaureate degree	76.5
Master's degree	86.3
Doctorate	94.0
Foreign degree[2]	76.0

[1] Includes nurses temporarily unemployed less than six months.

[2] No comparable degree granted in U. S.

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1. In designating ethnicity the federal government uses the term Hispanic to include persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race. The Functional Task Analysis Study originally used the category of Hispanic but, upon request of respondents, switched to the category of Mexican American during the course of the survey.

Some interesting comparisons are evident. Contrary to a widespread belief, diploma nurses do not appear to work full time as much as do nurses with associate and baccalaureate degrees, who work full time at about equal levels. However, diploma nurses are older, as Table N-27 indicates, and older nurses do not tend to do as much full-time work (Table N-19). Consequently, the apparent low level of full-time work by this group may reflect age more than it indicates the type of training. It would be interesting to hold age constant, and then determine which type of training seemed to produce nurses of a given age who tended to work full time the most.

(It should also be noted that in this and any other table reporting on highest degrees held by nurses, about one-eighth of the diploma nurses are reported as B.S. nurses since that many have gone on to the higher degree, as reported in Table N-24. It is not clear what the effect of this shift in counting more than 6,000 nurses is on any conclusions to be drawn.)

Marital Status

Another variable in the nursing work force is marital status. Table N-18 shows how the full-time status of employed nurses is affected by their marital status.

TABLE N-18

Percent of Nurses Employed[1] in California
Who Work Full Time, by Marital Status
January 1, 1975

MARITAL STATUS	WORK FULL TIME
	PERCENT
Total	72.5
Single	88.9
Married	64.3
Divorced	87.0
Widowed	76.8
Unknown	78.7

[1] Includes nurses temporarily unemployed less than six months.

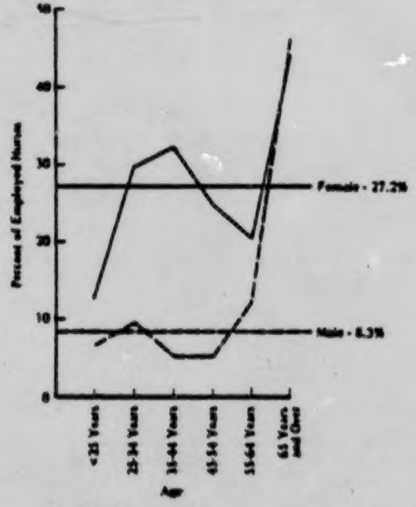
As would be expected, married nurses do not work full time as much as do single, divorced, and widowed nurses. With less than 2 percent of the licensed nurses being male, the influence of male nurses on the figures for married nurses is slight.

Sex of Nurses

Another significant variable in the working patterns of nurses is whether they are male or female. Only 3,138 of the 164,000 nurses licensed in California are males, a percentage of 1.9. Of this number, 2,761 are employed in California. But men tend to be full-time professionals in nursing to a greater degree than do women, as Table N-19 indicates.

TABLE N-19

Percent of Employed[1] Nurses
Who Work in California Part Time, by Sex and Age
January 1, 1975



[1] Includes nurses temporarily unemployed less than six months.

It is clear that male nurses work part time much less than do female nurses, although after age sixty there is virtually no difference between the sexes. At about age thirty-five, almost one-third of employed female nurses are working part time. By age fifty-five, the number of nurses working part time has declined to about 25 percent, before beginning a rapid increase to about 40 percent at age sixty-five.

Educational Background of Nurses

The nursing work force is made up of people with varying educational backgrounds, representing basic nursing education and advanced nursing education or other advanced degrees. The general distribution of degrees within the total number of nurses currently licensed by the State of California is shown in Table N-20.

TABLE N-20

Nurses Currently Licensed, By Basic Nursing Education

Type of Training	Number Currently Licensed	Percentage of Total
Associate degree	21,977	13.4%
Hospital diploma	114,656	69.9
Baccalaureate and professional	25,782	15.7
Noncomparable foreign degree	257	.2
Unknown	1,326	.8
Total	164,000	100.0%

In spite of the near demise of hospital diploma nursing programs, graduates of such programs still outnumber by far the graduates of the other two pathways of nurse training. Another interesting observation is that, in spite of explosive growth in Community College programs, the number of baccalaureate nurses still exceeds the number of associate degree nurses, although the gap can be expected to close and eventually disappear.

Additional insight into the relationship of educational level to patterns of work can be seen from Table N-21, which compares the total number of nurses licensed to the total number residing in California, by highest degree held.

TABLE N-21

Nurses Currently Licensed in California, And Residing in California, by Highest Degree

Highest Degree	Total Number Licensed	Percentage of Total	Total Number in California	Percentage of Total	Percentage Residing in California
Associate Degree	20,134	12.3%	17,736	13.5%	88.0%
Hospital Diploma	97,906	59.7	78,643	59.6	80.3
B.S., Health	28,606	17.4	22,275	16.9	77.9
B.S., Other	6,686	4.1	5,231	4.0	78.2
Master's, Health	5,814	3.5	4,180	3.2	71.9
Master's, Other	1,538	.9	1,128	.9	73.3
Doctorate	343	.2	237	.2	69.1
Foreign Degree (noncomparable)	150	.1	115	.1	76.7
Unknown	2,803	1.7	2,296	1.7	81.9
Total	164,000	100.0%	131,841	100.0%	80.4%

Perhaps the most significant observation from this table is that, of all nurses currently licensed in California, associate degree nurses reside in the State in substantially higher percentages than do those from other groups. Conversely, nurses with graduate degrees are most likely to reside elsewhere, even though licensed by this State.

A similar comparison is made in Table N-22 for nurses who are licensed and working, as well as living in California, by highest degree held. The final column compares the total number working in California to the total number licensed by California.

TABLE N-22

Nurses Currently Licensed, Working, and Located in California, by Highest Degree

Highest Degree	Total Number Working	Percentage of Total	Total Number in California	Percentage of Total	Percentage of Total Licensed, Working in California
Associate Degree	17,109	14.7%	14,876	16.3%	73.8%
Hospital Diploma	65,330	56.2	51,034	56.0	52.1
B.S., Health	21,946	18.9	16,857	18.5	58.9
B.S., Other	4,552	3.9	3,465	3.8	51.8
Master's, Health	4,816	4.2	3,265	3.6	56.2
Master's, Other	999	.9	699	.8	45.5
Doctorate	247	.2	140	.2	40.8
Foreign Degree (noncomparable)	117	.1	88	.1	58.7
Unknown	1,053	.9	725	.8	25.9
Total	116,169	100.0%	91,149	100.0%	100.0%

Again, it is clear that the associate degree nurse tends to stay and work in California at a considerably higher rate than does any other category of nurse. Age, however, may be part of this phenomenon, since the associate degree nurse is among the younger nurses. See Table N-27.

Another table reveals additional information about the associate degree nurse, as well as the nurse with an advanced degree. Table N-23 indicates the percentage of each ethnic group in nursing which has the associate degree, and advanced degrees.

Surprisingly, there is very little difference between ethnic groups (except for Filipinos) in the percentage of nurses with advanced degrees. However, there is considerable difference among ethnic groups in the percentage which has associate degrees. Fewer than one in six White and Oriental nurses has the associate degree.

Almost one in three Black, Mexican-American, and American Indian nurses have the associate degree as the highest educational credential.

TABLE N-23

Percent of Each Ethnic Group of Employed[1] Nurses in California Who Have Associate Degree and Master's Degree or Higher as Highest Degree Obtained January 1, 1975

ETHNIC ORIGIN	ASSOCIATE DEGREE	MASTER'S DEGREE OR HIGHER
	PERCENT OF ETHNIC ORIGIN	
Total	16.2	4.6
White	16.1	4.7
Mexican-American	37.6	4.3
Black	33.2	6.5
American Indian	30.5	5.5
Japanese	12.6	4.4
Chinese	11.9	6.7
Filipino	4.2	2.2
Other	6.9	4.2
Unknown	17.1	4.5

[1] Includes nurses temporarily unemployed less than six months.

Obtaining higher academic credentials occurs to some degree in nursing, as shown in Table N-24.

TABLE N-24

Percent of Employed[1] Nurses in California Who Have Obtained a Higher Degree January 1, 1975

BASIC NURSING EDUCATION	PERCENT OBTAINING HIGHER DEGREE
Associate degree	9.5
Hospital school diploma[2]	13.4
Baccalaureate degree[3]	11.7

[1] Includes nurses temporarily unemployed less than six months.

[2] Baccalaureate degree or better.

[3] Master's degree or better.

Note: Unknowns are excluded from calculations.

It is interesting to observe that hospital diploma graduates, numerically the largest group of nurses, have completed advanced degrees at a higher rate than have the associate degree or baccalaureate nurses.

Age of Nurses

Age is an important parameter of the nursing work force. Table N-25 displays data on the median age of all licensed nurses and employed nurses, by place of residence.

TABLE N-25

Median Age of Nurses Currently Licensed in California
By Whether Employed, Place of Residence
And Place of Employment
January 1, 1975

	MEDIAN AGE	
	All Nurses[1]	Employed Nurses[2]
	IN YEARS	
Total	41.8	39.2
California	42.3	39.5
Other states	39.9	38.0
Outside U. S.	36.2	34.6

[1] Place of residence.

[2] Place of employment.

The median age of working nurses is about two years younger than that of all licensed nurses. Nurses living and working in other states, and particularly those living and working abroad, tend to be younger than nurses in general.

The relationship of age to employment is shown in Table N-26 for all nurses licensed in California.

TABLE N-26

Percent of Nurses Currently Licensed in California Who are Employed[1] by Sex and Age - January 1, 1975

AGE	TOTAL	SEX	
		Male	Female
	PERCENT EMPLOYED		
Total	70.8	88.0	70.5
18–24 years	96.0	98.3	96.0
25–34 years	80.8	96.9	80.4
35–44 years	73.1	96.5	72.6
45–54 years	72.4	89.5	72.1
55–64 years	59.8	67.9	59.7
65 years and over	22.6	33.5	22.4
Unknown	80.4	a	80.7

[1] Includes nurses temporarily unemployed less than six months.

[a] Percent not calculated for less than 25 persons.

The higher level of employment of male nurses, obvious from the table, is not surprising. Perhaps what is surprising is that one-third of the male nurses and almost one-quarter of the female nurses continue to work beyond age 65.

The relationship between the age of the nursing work force and the educational preparation of nurses is shown in Table N-27.

TABLE N-27

Median Age by Highest Degree for all Nurses And Employed[1] Nurses in California - January 1, 1975

HIGHEST DEGREE	MEDIAN AGE	
	All Nurses	Employed[1] Nurses[2]
	IN YEARS	
Total	41.8	39.5
Associate degree	32.3	32.1
Hospital school diploma	46.3	43.3
Baccalaureate degree in health	34.8	33.8
Baccalaureate degree in other field	43.3	41.2
Master's degree in health	43.0	42.6
Master's degree in other field	50.1	48.7
Doctorate	48.9	47.8
Foreign degree[3]	39.8	41.7

[1] Includes nurses temporarily unemployed less than six months.

[2] In California only.

[3] No comparable degree granted in U. S.

Clearly, associate degree nurses are the youngest group of nurses--perhaps reflecting the relative newness of many two-year training programs--although nurses with a baccalaureate degree in Health Sciences are almost as young. Comparing ages of nurses by basic nursing education, as contrasted with highest degree held, produces a sharper comparison, as shown in Table N-28.

TABLE N-28

Median Age of All Nurses and Employed[1] Nurses
In California by Basic Nursing Education
January 1, 1975

BASIC NURSING EDUCATION	MEDIAN AGE	
	All Nurses	Employed[1] Nurses
	IN YEARS	
Total	41.8	39.5
Associate degree	32.4	32.2
Hospital school diploma	46.1	44.1
Baccalaureate degree[2]	32.3	32.2
Foreign degree[3]	39.5	40.3

[1] Includes nurses temporarily unemployed less than six months.

[2] Includes a few nurses where a Master's degree was basic education.

[3] No comparable degree granted in U. S.

Here, the associate degree nurse and the baccalaureate nurse have virtually identical median ages. Again, the diploma nurse is significantly older.

A final consideration of the age of nurses can be made with respect to ethnicity. Table N-29 contains comparisons of median age of all nurses, and employed nurses, by ethnicity.

TABLE N-29

Median Age of Nurses Currently Licensed in California By Whether Employed[1] and Ethnic Origin January 1, 1975

ETHNIC ORIGIN	MEDIAN AGE	
	All Nurses	Employed[1] Nurses
	IN YEARS	
Total	41.8	39.2
White	42.7	40.0
Mexican-American	35.7	34.9
Black	39.2	38.5
American Indian	40.3	39.6
Japanese	40.4	40.1
Chinese	37.3	36.2
Filipino	33.3	33.2
Other	34.3	33.8
Unknown	58.7	42.4

[1] Includes nurses temporarily unemployed less then six months.

Beyond the fact that the White nurse is the oldest nurse, it is difficult to interpret these data. Other sources reveal that the three minority groups—Mexican-Americans, Blacks, and American Indians—have entered nursing to a noticeable degree only in recent years; yet, the median ages of two of these groups are not much below that of Whites. Mexican-American nurses are definitely younger than most other nurses, indicating the recency of their training. Perhaps Blacks and American Indians have been educated equally recently, but were brought into the programs at an older age. These data on age and ethnicity of minority nurses, when better understood, may have relevance for future efforts in affirmative action.

Sources of the Nursing Work Force

California does not educate enough nurses to meet its needs, and is still dependent upon other states and countries for most of its newly licensed nurses. Table N-30 indicates where these new licensees were originally trained.

TABLE N-30

Source of New Registered Nurse Licensees: Selected Years, 1960-1977

		California Graduates		Other States and Countries			
Year	New Licensees	No.	Percent of new Licensees	Other States	Foreign Countries and Canada	Total	Percent of New Licensees
1960	6395	1189	19	4551	655	5206	81
1962	6641	1239	19	4420	982	5402	81
1964	7265	1441	20	4584	1240	5824	80
1967	7513	2197	29	3270	2046	5316	71
1969	8618	2586	30	5101	931	6032	70
1970	8423	2988	35	5004	431	5435	65
1971	8132	3265	40	4215	652	4867	60
1972	9131	3640	40	4039	1452	5491	60
1973	9115	3902	43	4096	1117	5213	57
1974	11,522	2897	25	6290	2335	8625	75
1975	12,021	4414	25	5691	1916	7607	75
1976	12,484	3499	28	6918	2067	8985	72
1977	12,602	3619	29	6993	1990	8983	71

Source: John Wong Report, updated by Board of Registered Nursing.

It is apparent from Table N-30 that until 1974 the State made steady progress in meeting a larger share of its need for nurses through its own graduates. At that time, smaller output from California programs and an abnormally high number of out-of-state nurses combined to reverse the trend of the 1960s and the early 1970s. Beginning with 1976, the percentage of California graduates among newly licensed nurses again seems to be rising.

The current composition of California's work force, by the location where basic nursing education was received, appears in Table N-31, both for the total number of licensees and for the number living in California.

It is clear that only 37.7 percent of the total licensees in nursing and 40.6 percent of those living in the State were trained in California. Of nurses from other states, the greatest number have come from the Middle Atlantic and North Central states. The largest group of foreign-trained nurses has come from the Philippines.

TABLE N-31

Nurses Currently Licensed in California, and Living in California, By Region Where Basic Education Was Received[1]

January 1, 1975

REGION OF EDUCATION	Total Number Licensed	Percentage	Total Number in California	Percentage
Total	164,000	100.0	131,841	100.0
California	61,903	37.7	53,591	40.6
All other states and territories[2]	83,452	50.9	64,147	48.7
New England	6,570	4.0	5,007	3.8
Middle Atlantic	17,020	10.4	12,982	9.8
East North Central	19,545	11.9	15,043	11.4
West North Central	16,420	10.0	13,158	10.0
South Atlantic	5,897	3.6	4,458	3.4
East South Central	2,335	1.4	1,781	1.4
West South Central	3,988	2.4	3,011	2.3
Mountain	6,369	3.9	4,798	3.6
Pacific[3]	5,195	3.2	3,829	2.9
Territories and possessions	113	.1	80	.1
Outside U.S.	18,645	11.4	14,103	10.7
Canada	5,047	3.1	3,973	3.0
Latin America	1,057	.6	871	.7
United Kingdom	2,093	1.3	1,725	1.3
Europe	1,410	.9	1,166	.9
Africa	77	a	62	a
Korea	560	.3	481	.4
Philippines	6,832	4.2	4,658	3.5
Thailand	480	.3	282	.2
Rest of Asia	755	.5	610	.5
Oceania	237	.1	191	.1
All Others	97	.1	84	.1

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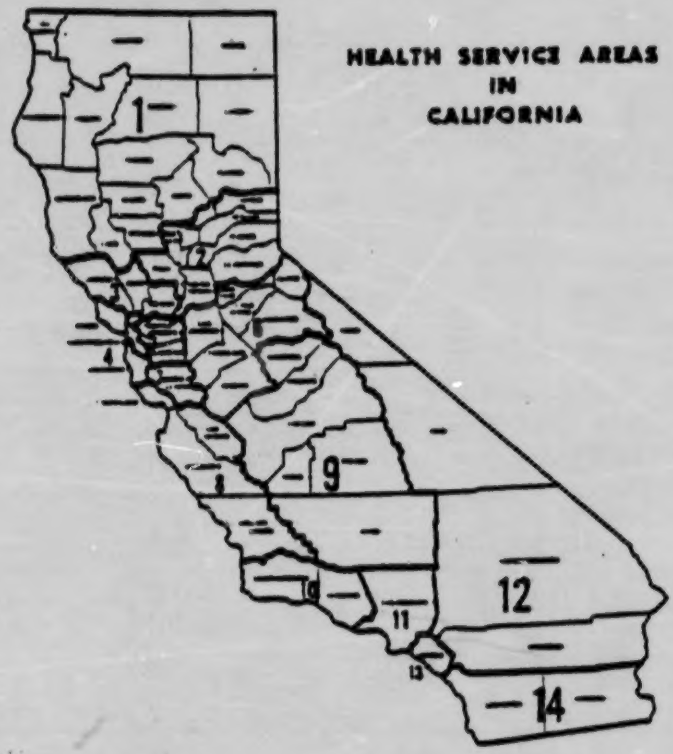
[1] As determined by the Board.

[2] U.S. Bureau of Census regions.

[3] Excludes California.

[a] Less than 0.05 percent.

Because the supply of nurses in California varies considerably from region to region, it is useful to know something of the composition of the nursing work force in each part of the State. For purposes of this discussion the Commission has used the Health Services Areas of the State, established pursuant to Public Law 93-641. These Health Service Areas, fourteen in number, are shown on the map below.



The nursing work force of each of these areas, by region of education, is shown in Table N-32.

There are considerable differences between regions of the State in the number of working nurses who have been educated in California. Region 1, northern California, has more than twice as many California-trained nurses, as a percentage of the total work force of the region, as does Region 14, which covers San Diego and Imperial Counties. Almost 10 percent of the nursing work force in Region 9, the southern San Joaquin Valley, was trained in Asian countries. Almost one in five nurses in Region 11, Los Angeles County, has been trained abroad, and the percentage for Region 4, the San Francisco area, is not far behind. Table N-32 clearly shows that nurses have been quite mobile in terms of in-migration.

TABLE N-32

Employed[1] Nurses by Region of Education And Health Service Area of Employment - January 1, 1975

HEALTH SERVICE AREA	TOTAL Number		UNITED STATES								OUTSIDE U. S.						
			Total U. S.	Calif.	Rest of U. S.	North East	North Central	South	West	Terri-tories	Total Outside U. S.	Canada	Latin America	United Kingdom	Europe	Korea, Thailand, Phillipine Islands	Miscellaneous
	NUMBER		PERCENT														
California, Total	94,373	100.0	87.4	40.4	47.0	13.6	19.9	7.0	6.4	.1	12.6	3.1	.8	1.6	.9	5.6	.9
Region 1	1,952	100.0	96.9	61.0	35.9	6.9	15.0	5.5	8.4	.1	3.1	2.2	.1	.4	.3	–	.2
Region 2	4,387	100.0	95.1	49.2	45.9	11.2	20.0	6.9	7.7	.1	4.8	1.8	.2	.7	.6	1.2	.6
Region 3	2,642	100.0	94.8	54.0	40.8	11.1	16.4	6.9	6.3	.1	5.1	1.8	.2	.5	.7	1.6	.3
Region 4	10,323	100.0	82.1	35.3	46.8	16.1	17.9	6.8	6.0	–	17.9	3.6	.8	3.4	1.8	7.1	1.2
Region 5	7,962	100.0	90.2	45.1	45.1	12.1	18.5	7.1	7.4	a	9.7	2.6	.4	1.3	.7	3.8	.9
Region 6	2,459	100.0	94.1	58.8	35.3	7.1	16.9	4.8	6.4	.1	6.0	2.5	.2	.6	.5	1.5	.6
Region 7	6,503	100.0	90.4	39.7	50.7	13.8	21.3	7.1	8.5	a	9.7	4.1	.3	1.3	.8	2.6	.7
Region 8	2,174	100.0	92.7	49.1	43.7	12.4	18.4	6.2	6.6	.1	7.2	2.4	.1	1.4	.4	2.3	.7
Region 9	3,553	100.0	94.3	56.9	37.4	8.6	16.3	6.2	6.3	–	5.7	1.6	.4	.6	.7	1.8	.5
Region 10	3,067	100.0	89.8	36.1	53.7	16.1	23.4	6.8	7.3	.1	10.2	4.0	.5	2.1	1.2	2.3	.2
Region 11	31,288	100.0	81.3	36.8	44.5	13.9	19.0	6.4	5.1	.1	18.8	3.5	1.6	1.6	.1	9.8	1.3
Region 12	4,955	100.0	93.1	44.1	49.0	11.4	20.8	9.6	7.1	.1	6.9	2.1	.1	.8	.8	2.2	1.0
Region 13	6,266	100.0	92.3	35.7	56.6	17.4	25.7	6.9	6.5	.1	7.7	3.4	.5	.9	.5	1.8	.8
Region 14	6,850	100.0	88.8	29.0	59.8	17.4	25.5	10.0	6.9	a	11.2	2.4	.5	1.0	.4	6.5	.4
Unknown	2	b															

[1] Includes nurses temporarily unemployed for less than six months.

a Less than 0.05 percent

30,b b Percent not calculated for less than 25 persons.

Note: Health service area regions as established pursuant to Public Law 93-641.
Place of employment as reported in the questionnaire except when not stated, place of residence is used.
Percents are rounded independently and may not add to total.

The question of mobility has serious implications for the educational planner concerned with the training of nurses. If nurses are highly mobile, it may not be necessary to educate them at as many locations as if they were not mobile. Table N-33 shows the percentage of nurses who are graduates of the three basic types of nursing programs and who remain in the same Health Service Area (HSA) in which they were trained.

TABLE N-33

Percent of Employed[1] Nurses Educated in California Who are Working in the Same Health Service Area Where Educated, By Basic Nursing Education and Health Service Area of Education January 1, 1975

HEALTH SERVICE AREA OF SCHOOL OF NURSING	TOTAL	BASIC NURSING EDUCATION Associate Degree	Hospital School Diploma	Baccalaureate Degree
	PERCENT OF GRADUATES[2]			
Total	49.2	67.7	40.5	38.0
Region 1	29.8	68.8	3.0	17.0
Region 2	62.0	72.9	53.2	57.4
Region 3	33.3	38.1	27.4	–
Region 4	31.8	67.8	28.8	25.8
Region 5	42.6	68.1	35.1	(52.8)
Region 6	58.7	69.3	41.5	–
Region 7	42.5	64.7	41.9	29.3
Region 8	64.5	67.5	*	–
Region 9	60.5	76.6	42.2	53.0
Region 10	50.5	66.7	31.1	–
Region 11	61.2	73.0	52.9	58.8
Region 12	47.4	59.4	40.0	28.3
Region 13	58.6	63.5	25.2	–
Region 14	46.5	77.9	32.7	49.6

[1] Includes nurses temporarily unemployed less than six months.

[2] Employed in California.

* Percent not calculated for less than 25 graduates.

Note: Place of employment as reported on questionnaire, except when not stated, place of residence is used.

Health service area regions as established pursuant to Public Law 93-641.

Percents in parentheses are based on 25–49 graduates.

The ability of a region to retain its own graduates ranges from a high of 64.5 percent in Region 8, the northern San Joaquin Valley, to a low of 29.8 percent in Region 1, northern California. In all regions of the State, employed associate degree nurses tend to stay in the area in which they took their basic nursing education considerably more than do diploma and baccalaureate nurses. The percentage of associate degree nurses who do so is generally 60 percent or higher. The conspicuous exception is Region 3, Sonoma, Solano, and Napa Counties, where, perhaps because of their proximity to the Bay Area, locally-educated nurses tend to leave more than stay.

All of the elements discussed in this profile have relevance for the statewide educational planner. It is clear that the choice of who is selected to enter nursing education, what kind of education is offered, and the location of the education are important factors which influence the work patterns of nurses, and ultimately determine the effectiveness of public policies concerning nursing manpower. As will be evident shortly, it may soon be necessary to exercise these choices in order to achieve a more efficient use of nursing manpower.

SPECIAL CONSIDERATIONS

Availability of Data

Any analysis of nursing education is limited by the data available. As previously noted, the standard educational data systems such as HEGIS do not report adequately on all aspects of nursing education. Furthermore, neither licensure boards nor professional associations fill this information void, as do the professional associations in medicine. The three-tiered educational system in nursing (four, if L.V.N. programs are counted) further complicates the identification and analysis of professional education within the discipline.

Attrition

But another problem overshadows the difficulties which are encountered in defining and describing nursing education. That problem is attrition--the number of people who leave the field of nursing during and after their education, and throughout their professional careers. None of the other health science disciplines experiences anything like the attrition which characterizes nursing.

Some initial attrition occurs in the nursing education programs, as it does in any kind of educational program, as students decide they have chosen the wrong major. By comparing the number of students entering nursing, and the number graduating (from two to four years later), one can get some measure of the attrition that exists. Table N-34 reports these comparisons for two-year programs.

TABLE N-34

Attrition in Associate Degree Nursing Programs

	STATE OF CALIFORNIA			UNITED STATES		
Year Admitted	Number Admitted	Number Graduated 2 Years Later	Percent Not Graduating	Number Admitted	Number Graduated 2 Years Later	Percent Not Graduating
1969	2,818	1,919	31.9%	25,142	14,534	42.2%
1970	3,123	2,471	20.9	29,433	18,926	35.7
1971	3,502	2,557	27.0	36,454	24,497	32.8
1972	3,804	2,895	23.9	43,733	28,919	33.9
1973	3,969	3,087	22.2	47,940	32,183	32.9
1974	4,113	3,317	19.4	49,368	34,625	29.9
1975	4,286	3,545	17.3	52,232	36,289	30.6
1976	4,429	(3,482)*	(21.4)	53,610	-	-

*This figure is an update from the State Board of Registered Nursing.

Source: Modified from Tables 20 and 28, NLN Nursing Data Book, 1978.

It is difficult to determine if this rate of attrition is excessive for a two-year program. Viewed with respect to the competitive admissions situation which exists in nursing programs, the high cost of these programs, and the low attrition in other health science fields, it may seem high; viewed with respect to attrition in two-year education programs in other fields it may not be out of line.

Attrition in four-year programs is harder to interpret. Table N-35 displays data on the number of admissions into B.S. programs, and the number of graduates four years later.

TABLE N-35

Attrition in B.S. Degree Nursing Programs

	STATE OF CALIFORNIA			UNITED STATES		
Year Admitted	Number Admitted	Number Graduated 4 Years Later	Percent Not Graduating	Number Admitted	Number Graduated 4 Years Later	Percent Not Graduating
1969	1,350	931	31.0%	18,942	13,055	31.1%
1970	1,554	1,136	26.9	20,299	16,957	16.5
1971	1,883	1,339	28.9	27,228	20,170	25.9
1972	1,557	1,243	20.2	30,348	22,579	25.6
1973	1,361	1,286	5.6	32,461	23,452	27.8
1974	1,534	1,404*	(8.5)	34,956	-	-
1975	1,648	-	-	36,320	-	-
1976	1,735	-	-	36,670	-	-

*This figure is an update from the State Board of Registered Nursing.

Source: Modified from Tables 19 and 27, NLN Nursing Data Book, 1978.

Similar, but not as complete, data are available from the Board of Registered Nursing for individual institutions. Comparing institutions one can observe that some four-year nursing programs show varying degrees of attrition; some, surprisingly, show gains in output over the enrollments of four years earlier. In most disciplines this might be expected to occur in four-year institutions because of the heavy influx of Community College transfers. In four-year nursing programs, a bulge in upper division enrollments might be expected to reflect instead those students who had changed majors or transferred, and were unable to complete the requirements in the normal time. In addition students who are L.V.N.s or who otherwise meet many of the course requirements in nursing can be enrolled at the upper-division level. In any event, attrition in the four-year institutions warrants further analysis.

The second form of attrition in nursing occurs between graduation and licensure. Some of this attrition may be more apparent than real. For example, Table N-36 below shows the number of California graduates in nursing since 1963, and the number of California graduates who have been licensed during the same period. At first glance, it appears there has been significant attrition, particularly since 1974.

TABLE N-36

R.N. Licensure of California Graduates in Nursing

Year	Number of California Graduates	Number of California Graduates Licensed
1964	1,579	1,441
1965	1,814	N/A
1966	1,938	N/A
1967	2,103	2,197
1968	2,318	N/A
1969	2,625	2,586
1970	3,071	2,988
1971	3,302	3,265
1972	3,895	3,640
1973	3,939	3,902
1974	4,523	2,397
1975	4,885	4,414
1976	5,193	3,499
1977	5,226	3,619

There is an explanation for some of the difference between the number of graduates and the number of graduates licensed each year. In 1975, the Legislature authorized students in four-year nursing programs to take the license examination after their third year of education. Those who did so do not appear among the California graduates licensed that year, since they were not graduates. The following year they are listed as graduates--if indeed they graduate--without being listed as licensed that year, inasmuch as they were licensed the previous year. Each year, there are perhaps 1,500 juniors in four-year nursing programs, but the Board of Registered Nursing does not have figures on how many of these third-year students take the examination.

For this group attrition may or may not be more apparent than real. However, there are two other groups who are experiencing real attrition: those who graduate but never take the examination in California (but may take it in another state), and those who take the examination and fail. The latter group is displayed in Table N-37.

TABLE N-37

Licensure Examination Failure Rates Among Graduates of California Nursing Programs

Year	Number of Graduates	Number of Graduates Taking Examination	Number of Graduates Failing Examination	Percent of Graduates Failing Examination
1975	4,885	4,906	492	10.0%
1976	5,193	3,884	385	9.9
1977	5,226	4,106	487	11.9

Source: Nursing Board.

The third form of attrition, that of nurses who do not stay active in the profession after licensure, has always existed, and has been associated with the effects of a profession which has been staffed almost completely by women. Traditionally, nursing has been viewed as a field in which a woman can work for a while, and then drop out for marriage and child raising, perhaps to return later.[2] Recent changes in the status of working women should have lessened that attrition. These changes, as reported by the Bureau of Labor Statistics, included women entering the labor force in much larger numbers, staying longer and "stopping out" less frequently and for shorter periods of time. Attrition apparently has not been reduced in the face of these changes; during the past dozen years, the percentage of nurses currently registered but inactive has been between 30 and 35 percent of the total licensed.

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[2] The John Wong Report cites a 1969 Massachusetts study which identified the reasons inactive nurses give for not returning to work: family needs, 64.0%; need for refresher training, 20.0%; hours of work, 13.0%; husband opposed, 1.8%; health, 8.3%; age, 6.1%; low salary, 5.4%; transportation, 4.6%.

With increasing frequency today the cause of attrition among working nurses is being identified as a deep dissatisfaction with the day-to-day doutine of a nurse. This dissatisfaction is epitomized in both the title and the text of Marlene Kramer's book, Reality Shock, Why Nurses Leave Nursing. Conversations with nursing educators confirm there is wide agreement about the existence of considerable job dissatisfaction among nurses, and that this factor contributes significantly to the continuing high attrition.

Thus, attrition remains a serious problem in California, offsetting the effects of continuing in-migration of nurses and the rapid expansion of nursing programs. Because only a limited number of people get to enter nursing programs, and because these programs tend to be fairly expensive, the State must be concerned about the relative imbalance between the number of nurses educated and the number working. The Commission believes, however, that the nursing profession must eventually resolve internally the problem of attrition, rather than await governmental solutions. However, it is clear that higher education institutions have a major responsibility to improve both the admissions process and the educational programs for nurses to insure that the student who completes the education is psychologically, as well as intellectually, prepared for the daily work of a nurse.

In recent months the problem of nursing attrition has been exacerbated by the passage of Proposition 13. Public hospitals have been unable to give raises to their nurses; quite understandably, nurses are relocating to private hospitals which are not subject to the legislation, or are choosing not to work regularly. Even before Proposition 13 was passed, a problem had developed around the use of nursing registries, which are essentially employment agencies. Hospitals which were short of nurses turned to registries for temporary help. The registry charged the hospital some 20-25 percent more than the hospital would have paid a salaried nurse for the same shift, adding considerably to operating costs. The incentive for the registry was clear: profit. The incentive for the nurse could be either the higher pay, if the arrangement with the registry actually meant more take-home pay for the nurse, or, more likely, the opportunity to work intermittently and under conditions of his or her choice, something the nurse could not have as a salaried employee.

There is no shortage of nurses in California, but there is definitely a shortage of those who are willing to work under present conditions, the drawbacks of which are generally not perceived as just economic. This problem requires the attention of all concerned groups: the nursing profession, the licensure boards, the employers (e.g., the California Hospital Association), the Department of Health, the postsecondary education establishment, the medical profession, consumer groups, and State government in general.

It is appropriate to conclude this discussion by quoting from Jerome Lysaught's definitive study for the National Commission for the Study of Nursing and Nursing Education:

> Yet nursing has been and is a troubled occupation. It is an occupation that fails in every characteristic to achieve the status of a full profession . . .. It is an occupation that has never controlled its own destiny . . .. It is an occupation fraught with paradox and promise . . . the stepchild of the health professions.

FINDINGS

1. Nursing education programs in California have adequate capacity to meet the needs of the State for new nursing graduates, if the continued in-migration of nurses continues at current levels, which provides more than two-thirds of the newly licensed nurses.

2. Nursing is a singularly divided health profession, with fundamental ideological differences existing within the profession as to the nature of nursing practice and nursing education. The strong resistance in California to moving toward a single educational standard in nursing makes these differences particularly apparent, but nursing educators insist that progress is being made toward the resolution of these differences.

3. Some attrition exists in nursing education programs and immediately following graduation; high attrition exists within the nursing profession. However, the attrition among working nurses varies considerably among groups, with some staying in nursing longer than others, probably because they cannot afford the luxury of dropping out. The groups that persist include certain ethnic minorities, and those who are primary breadwinners such as men and unmarried women.

4. Associate degree nurses are considerably less mobile than other nurses, and tend to stay in California and in the region of the State in which they were trained.

5. Admissions, curriculum, and articulation in nursing education have all been subject to considerable legislative intervention.

UTILIZATION OF CLINICAL SITES

Much could be written about the utilization of clinical sites in nursing education. In the same sense that virtually any hospital can be a clinical training site for medical education, any of a number of California hospitals can provide clinical training opportunities in nursing education. In fact, 130 hospitals once had their own nurse training programs but have ceased to operate them. These hospitals, plus all the other hospitals in the State, represent potential clinical training locations, and indeed some may be currently providing such programs.

The special problems in setting up and operating clinical training programs in nursing were explored in some depth in the John Wong Report. Citing the findings of a 1974 panel of Community College nursing educators and clinical supervisors, the Wong Report identified five such problems: scheduling, supervision, management, curriculum, and attitude. While there is no indication of the incidence of these problems, and no attempt to rank them in degree of severity, the Report makes all of these problems seem quite real and plausible.

The basic problem in scheduling is that all training programs, in nursing and in other health science fields, want to use hospital facilities in "prime time"--mid-morning and mid-afternoon--but few programs want to use the facilities at other times of the day when they are much less crowded. Thus nurses, who after graduation may be hired to work evening or night shifts where resourcefulness and self-reliance are essential, have received their clinical training only in the daytime when all key personnel of the hospital and the health care team are available. A secondary problem of scheduling occurs in making sure that didactic instruction and clinical experience are related sequentially and in meaningful ways.

Several supervision problems exist for clinical training programs. First, there are costs to the hospital when its personnel assist in training, costs which are sometimes difficult for the hospital to justify to its constituencies. As a result, there are sometimes imprecise lines of responsibility for training, with equally unclear accountability for training programs.

From the standpoint of hospital management, training programs seem to generate too many meetings requiring staff time, while still not providing adequate hospital involvement in the planning of the training conducted within the facility. New training programs do not seem to have been planned with proper attention given to clinical components. Furthermore, evaluation of clinical programs is inadequate, and does not properly involve administrative personnel.

The primary curricular problem is that clinical experiences are often not designed to teach specific skills and behavior, becoming instead just unstructured observation. It is also quite possible that clinical training occurs too late in the total educational program; some students may need the experience much earlier in their education to determine if they really want to do the tasks that nursing demands. There is also the criticism that clinical training "teaches the license examination," rather than providing the broad experiences the future nurse needs.

Perhaps the key attitudinal problem is that the image of nursing as a secure profession attracts many undedicated students who resent the realistic hospital setting and the real practice of nursing. Other problems include conflicting demands on the time of hospital personnel between helping student nurses and caring for patients; and the excessive attention in the hospital to the physician/patient relationship rather than to the nurse/patient relationship, due to the scheduling of training during "prime time."

In addition to these operational problems, a number of fundamental questions must be considered in establishing clinical training programs for nurses. The Wong Report discusses several such questions, including the legal responsibilities under contracts establishing clinical relationships (delineation of such responsibilities as liability, workmen's compensation, et al.); staffing; governance and control; etc. Inasmuch as working out all these contractual relationships can be a difficult task, agreements for additional clinical training in nursing cannot be expected to develop readily.

RECOMMENDATIONS

1. The Postsecondary Education Commission, together with the Division of Health Professions Development in the Office of Statewide Health Planning and Development, should jointly establish a task force to make a differentiated assessment of statewide nursing-care needs and manpower resources. This group should be made up of nursing educators, health planners, hospital spokespersons, legislative staff, representatives of licensure boards and professional associations, working nurses, et al. The task force should explore ways of determining the supply of and demand for nurses, including specialists; resolve problems in the education, employment, and retention of the proper number and types of nurses; and assist various agencies and organizations to work together toward fuller utilization of nursing manpower resources.

2. In order to achieve better coordination and articulation, the two boards now licensing nurses--the Board of Registered Nursing and the Board of Vocational Nurse and Psychiatric Technician Examiners--should be combined into a single board with responsibilities for all licensure of patient-care personnel.

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CHAPTER III

DENTAL EDUCATION

There are five dental schools in California, all but one of which have four-year programs. Two of these schools are part of the University of California, located on the San Francisco and Los Angeles campuses. Three are in private institutions: the University of Southern California; the University of the Pacific (whose three-year dental school is in San Francisco); and Loma Linda University.

The Health Manpower Plan, which devotes considerably less attention to dentistry than to medicine, indicates that the supply of dentists is quite adequate, but that there is need for more dental care. Presumably, even if all people had the economic means to obtain the dental care they need, many would continue to avoid the dentist.

The Health Manpower Plan makes four recommendations on dental manpower, paraphrased below:

1. The State should promote fluoridation of water as a means of reducing dental caries, and thus the need for dentists.

2. No special efforts to recruit additional dentists should be made, unless the increased numbers are targeted for underserved areas or populations. If additional numbers are trained, there should be parallel efforts to increase the number of dental auxiliaries and the number of minority personnel in dental occupations.

3. The use of expanded-role dental assistants and hygienists should be enhanced by clarifying their legal status.

4. The State should encourage experimentation with the training and utilization of an expanded-role, mid-level auxiliary who would perform a broad range of preventive, screening, and dental care functions under the general direction of a dentist.

This chapter examines dental education in the same format used for medicine and nursing. However, the information available on dental education may not be as complete as that available for those health science fields which have been scrutinized more intensively in recent years.

ADEQUACY OF PROGRAM SIZE

The basic indices of program size are the same for dentistry as for other health occupations.

Output of California Dental Programs

The output of the five dental schools in California since 1966 is shown in Table D-1 on page 3.

As the table indicates, the output of dental schools in California more than doubled in the nine years following 1965, but has declined in recent years from the peak attained in 1974. Some of the increased output in 1974 and 1975 can be attributed to the accelerated graduation of an extra class at the University of the Pacific and Loma Linda University, but only the former has continued the three-year program.

Enrollment in Dental Schools

Enrollment in the five dental schools in California since 1972-73 is displayed in Table D-2, also on page 3. Enrollments do not seem to have increased as rapidly as has the number of graduates.

DENTAL AUXILIARIES

There are two types of auxiliary personnel in dentistry. The dental assistant works with the dentist during examinations and treatment. The dental hygienist generally works alone, under the general supervision of a dentist, cleaning teeth and carrying out oral prophylaxis.

Another paraprofessional is the dental technician or technologist, who makes crowns, bridges, and dentures (often in private laboratories) to the specifications of a dentist. Proposals have been made to allow "denturists," a newer term for dental technicians, to fit and sell dentures directly to the public, bypassing the dentist. A recent initiative in Oregon authorizing such practice passed by a vote of more than three to one. The Federal Trade Commission is considering regulations which would allow denturists to function as independent businessmen. In addition, a bill has now been introduced in the California Legislature (AB 921, Alatorre) for the licensing and regulation of denturists. The dental profession is generally opposed to such proposals.

Unlike hygienists and assistants, however, dental technicians/technologists are not licensed in California and will not be considered as mid-level practitioners in this study.

Baccalaureate programs in dental hygiene are offered by the University of California, San Francisco; Loma Linda University, and the University of Southern California. Two-year programs in dental hygiene technology are offered by twelve Community Colleges. There

TABLE D-1

Degrees Conferred by California Dental Schools, 1966-78

School	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
UCSF	72	70	68	71	73	74	72	68	77	73	89	76	88
UCLA	--	--	27	26	74	92	91	90	93	99	85	94	106
USC	94	82	101	107	118	113	121	130	124	122	147	132	NA
UOP	40	46	58	55	61	79	93	97	191	119	125	137	127
Loma Linda	41	57	55	59	59	64	56	64	69	120	66	66	73
Total	247	255	309	318	385	422	433	449	554	533	512	505	394

Source: John Wong Report, updated by HEGIS.

TABLE D-2

Enrollment in California Dental Schools

	Actual							Projected			
School	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
UCSF	317	333	339	352	377	384	401	388	407	426	426
UCLA	395	420	428	425	426	425	406	424	424	424	424
USC	497	502	500	519	508	511	521	NA	NA	NA	NA
UOP	NA	NA	NA	NA	404	NA	401	NA	NA	NA	NA
Loma Linda	270	273	289	284	208	233	255	NA	NA	NA	NA

Source: HEGIS, UC Statistical Summary.

are forty two-year programs in dental assisting accredited by the Commission on Accreditation of the American Dental Association (ADA), which are located largely in Community Colleges. In addition, there are several dozen programs, generally in private career schools, which have sought direct approval from the State Board, an alternative to national accreditation.

Because the Higher Education General Information Survey (HEGIS) does not identify specific allied health fields, it is difficult to obtain data on graduates of two-year programs in dental assisting and dental hygiene technology. The extent of demand for these paraprofessionals is also unclear. Late in 1977 the Commission was urged to disapprove a proposed dental hygiene technology program in a Community College in Orange County by a group of dental hygienists who argued that the local market was already overcrowded. Nevertheless, the program was finally authorized by the Chancellor's office on the grounds that there were opportunities elsewhere in the State.

Dental hygienists have been licensed for more than fifteen years in California.[1] Recently, there has been considerable interest expressed by the Legislature in other types of dental auxiliaries. In 1972 the Legislature created the Advisory Committee on Utilization of Dental Auxiliaries. The Committee recommended the creation of new auxiliaries to provide direct services to patients, as follows:

1. Dental Assistant (DA)
2. Registered Dental Assistant (RDA)
3. Registered Dental Assistant in Extended Functions (RDAEF)
4. Registered Dental Hygienist (RDH)
5. Registered Dental Hygienist in Extended Functions (RDHEF)

The recommendation also dealt with the scope of practice for each auxiliary, and the need for career ladders between the various levels.

In 1974 the Legislature enacted into statute the five levels of dental auxiliary recommended by the Committee, and provided guidelines for the Board of Dental Examiners, which was charged with developing appropriate regulations for implementing the law, including provisions for upward career mobility.

The Board has published regulations covering the traditional categories of dental assistant, registered dental assistant, and registered dental hygienist, including some expansion of roles for these auxiliaries. But it has moved slowly in establishing the categories of extended-function auxiliaries, in which no one, as yet, has been licensed. The Legislature has expressed impatience with the Board for its unwillingness to implement these two new auxiliaries within the prescribed time. Also, the staff of the Health Career Ladders Project study of dental careers has criticized the Board for not placing the proper emphasis on multiple routes to licensure in the various categories which were mandated by the Legislature. The Board has responded that until the effect of an expanded role for existing dental auxiliaries has been determined, it is unwise to create additional auxiliaries.[2]

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[1] Recently, the Department of Consumer Affairs recommended that consumers be allowed to deal directly with a hygienist, rather than going first to a dentist for referral, and legislation authorizing such procedure has been introduced in the Legislature. The dental profession generally opposes this proposal.

The Office of Statewide Health Planning, through its experimental health manpower programs authorized under AB 1503, has recommended further experimentation with expanded-role dental auxiliaries, particularly with the dental nurse concept from New Zealand. However, since the Board is still unwilling to implement less extensive broadening of the roles of existing paraprofessionals, it is unlikely that any training program would be established in the near future for a dental paraprofessional with a much broader scope of practice.

EDUCATIONAL OPPORTUNITY

Dentistry remains a popular, and thus competitive, career choice for Californians. For example, in 1975 the School of Dentistry at the University of California, Los Angeles, admitted 106 of 1,996 applicants, or 5.3 percent. The School of Dentistry at the San Francisco campus admitted 88 of 1,198 applicants, or 7.3 percent. Two years later, the Los Angeles campus admitted 5.8 percent of its applicants and the San Francisco campus, 11.0 percent. Undoubtedly, duplicate applications were submitted, therefore a somewhat higher percentage of applicants was probably admitted.

No comparable data are available for the three private dental schools. However, the John Wong Report contains some general data on the total number of applications and admissions to the five dental schools in California. In 1974, these schools received a total of 10,433 applications—presumably including duplication. No figure is given for the number of first-year spaces available in the five schools for 1974, but in 1975 there were 544 such spaces.

In 1974, according to the Wong Report, Californians submitted 16,259 individual applications to dental schools in the United States, including California. These applications came from 1,977 people, for an average of 8.2 applications per Californian. Of that number, 565 Californians were admitted: 180 to the University of California, 254 to the three private dental schools, and 131 to out-of-state schools. The acceptance ratio for these California applicants was 28.6 percent, compared to 30.3 percent for Californians who sought admission to medical school in 1976. This ratio suggests serious problems of educational opportunity in dental education.

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[2] In December 1978, the Board of Dental Examiners instructed its Committee on Dental Auxiliaries to provide to the Board within two months a preliminary report on the implementation of the extended-function category for dental auxiliaries and, by June of 1979, a final plan for extended functions.

In other respects, however, opportunities for dental education in California seem relatively good. The Wong Report notes that no other state has as many dental schools as California, or as many first-year places in dental school. In 1975, California schools accounted for 9.4 percent of the first-year places in dental schools nationally, compared to 6.4 percent of the nation's first-year seats in medical schools, and Californians occupied 10 percent of those first-year places.

Furthermore, unlike physicians, dentists in California have been educated largely within the State. A 1975 study revealed that 62 percent of the active non-federal dentists in California had been trained here, and that trend continues. Thus, in-migration of trained professionals from other states does not pose the same threat to educational opportunity for Californians to enter dental school as it does for those hoping to attend medical school. Nevertheless, a highly competitive situation exists.

A comparison of the number of Californians admitted to medical school and dental school provides further insight into this problem. For medical schools, 1975 admissions are used; for dental schools, only 1974 admission figures are available. Nevertheless, the comparisons should still be valid.

	Total Number of Californians Admitted, U.S., and Percentage	Number of Californians Admitted to UC, and Percentage	Number of Californians Admitted to Private California Schools, and Percentage	Number of Californians Admitted to Out-of-State Schools, and Percentage
Medical Schools	1,203 100%	510 42.4%	232 19.3%	461 38.3%
Dental Schools	565 100%	180 31.9%	254 44.9%	131 23.2%

One might be tempted to conclude that the relatively low percentage of Californians admitted to dental school (28.6%) is because of the absence of sufficient seats in the University of California's two programs. However, the table shows that the University and the private dental schools together account for 76.8 percent of the California residents admitted nationally, while in medical education the State's public and private schools account for only 61.7 percent of the total.

One might also begin to suspect that Californians do not aggressively pursue admission to out-of-state dental schools to the same degree as to out-of-state medical schools, and that this factor contributes to the apparently limited overall opportunity for dental education. Indeed, one would have to conclude that opportunity for Californians to be admitted to the State's dental schools was greater than the opportunity for Californians to enter medical school in this State, or for Californians to enter dental schools nationally.

SPECIAL CONSIDERATIONS

Perhaps the most significant factor in determining the adequacy of dental education programs is the difference, previously noted, between demand for dental service (which seems reasonably in balance with supply) and the need for dental service (which is large and only partially met at present). The implications of this situation for the planner are not clear.

Many people do not receive proper dental care for economic, as well as psychological, reasons. Therefore, it might be wise public policy to look to increased use of dental auxiliaries in underserved areas as a cost-effective means of providing greater amounts of dental care, and perhaps even as a psychologically less formidable group of health professionals than dentists. The dental auxiliary in school, industrial, or neighborhood settings might provide an excellent delivery system for much routine dental care, particularly of a preventive nature, including the provision of psychological support to patients who needed additional treatment from a dentist.

In any event, the issue of demand vs. need in dental care warrants further consideration by health planners.

FINDINGS

- California's dental education programs appear adequate to meet the needs for dental manpower as identified in the Health Manpower Plan.

- The development of expanded roles for dental auxiliaries, and related training programs, would be enhanced if the State were to clarify and codify the scope of practice of extended-function dental auxiliaries.

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UTILIZATION OF CLINICAL SITES

Dental schools utilize clinical training extensively throughout the entire professional curriculum. From an administrative point of view it is more convenient and less expensive to establish dental clinics close to the dental schools they serve. Since four of the five dental schools in California are in urban settings, this arrangement generally provides an adequate clinical population for the dental school, and it also provides a source of low-cost dental care for disadvantaged residents of the urban community.

It is also possible to establish dental preceptorships and clinical training in rural settings. While more difficult to initiate than urban clinics, such arrangements have been made successfully by several dental schools in California.

RECOMMENDATIONS

1. The State should clarify and codify the scope of practice of extended-function dental auxiliary personnel, and should provide educational programs to prepare Californians for these paraprofessional fields.

2. Greater use should be made of expanded role dental auxiliary personnel, particularly in meeting dental needs in underserved areas.

3. Additional minority students should be recruited for careers as dental auxiliary personnel as a means of facilitating community screening and peer counseling which will provide assistance and support to people in underserved areas who need further dental care.

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CHAPTER IV

PHARMACEUTICAL EDUCATION

Professional education in pharmacy is provided in California by three institutions: the University of California, San Francisco; the University of Southern California; and the University of the Pacific. Each of these institutions has a program leading to the degree, Pharm. D. In addition, the University of the Pacific also has a B.S. program in pharmacy.

Licensure as a pharmacist in California requires graduation from an approved four-year program, and serving a one-year internship. The Pharm. D. programs are four-year programs, but have prerequisites of two years of pre-pharmacy for a total of six years of higher education. The B.S. program at the University of the Pacific has a pre-pharmacy requirement of at least one year. The one-year pre-pharmacy requirement is imposed by the American Council on Pharmaceutical Education, the accrediting body for the profession, whose accreditations are used by the State Board of Pharmacy in determining the eligibility of graduates for licensure.

The Health Manpower Plan makes no formal finding concerning manpower needs in pharmacy. It does suggest, however, that supply and demand are reasonably balanced, with the only possible shortage of pharmacists occurring if a national health insurance plan heavily involving pharmacists were to be established. (The Health Manpower Plan acknowledges, however, that the procedures for estimating supply and demand are less well developed in pharmacy than in any other health science field.) The Plan also notes the widespread distribution of California's approximately 12,000 pharmacists, and the fact that most of them utilize only a small portion of their potential capability and knowledge in their everyday work, representing a waste of trained manpower. The Plan makes two recommendations concerning pharmacy:

(1) The professional role of pharmacists in the delivery of primary health care should be expanded to make maximum use of the scope and nature of professional pharmacy education.

(2) The State should encourage and support further experimentation with training of pharmacy technicians for functions as expanded role pharmacy auxiliaries and the training and utilization of such personnel should be evaluated for quality of care, public acceptability and cost/benefits.

One important factor is apparent in studying pharmacy; it is a field in transition. In the past, pharmacy has had a commercial orientation; the pharmacist was partly a health professional and partly a retailer. The emphasis is now shifting toward the pharmacist as a full-fledged member of the health team with expertise in the use and effects of medication unmatched by that of any other health professional. The American Pharmaceutical Association has indicated that the six-year Pharm. D. degree, with its orientation toward patients rather than products should be the standard preparation for this new breed of pharmacist.

However, the very nature of pharmacy may require that its practitioners continue to be oriented toward marketing. Unlike physicians' offices, the location of pharmacies remains a function of consumer convenience.[1] Three quarters of the pharmacists in California still work in chain or independent drug stores. In the smaller of these establishments, the familiar corner drug store, the pharmacist, whether the owner or an employee, frequently assists customers in purchasing proprietary drugs as well as various sundries--and in an earlier era filled in behind the soda fountain when necessary. In a 1973 survey in California, quoted in the John Wong Report, 71 percent of active pharmacists reported spending some of their time in selling non-prescription drugs and 33 percent reported spending time in selling nonhealth items.

Under these circumstances, the Department of Health's concern may be valid--that registered pharmacists, particularly those trained in the broader programs of recent years, often do not function at the full level of their capabilities.[2] However, it also may be true that the public expectation for pharmacy includes continued, and perhaps even greater, attention to aggressive marketing of drugs—e.g., generic prescriptions and discount drugs. If this is the case, making the pharmacist more of a professional consultant on medication, and thus less concerned with the cost to the customer, might be viewed by the public as a move in the wrong direction.[3] Thus, pharmacy education may have to continue to provide a graduate who can operate comfortably in two different worlds: professional health care and retailing.

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[1] Even though commercial in its orientation, retail pharmacy is not a bastion of rugged free enterprise. It tends to be highly regulated because of its central role in the distribution of potentially dangerous substances.

[2] Pharmacists are widely distributed and are, in some small towns as well as inner-city neighborhoods, the only health professional immediately available to many people. This might suggest that they also have additional potential for delivery of health care.

[3] In the legal action to be discussed later in this chapter, the American Association of Retired Persons, testified in support of the chain drug stores who argued that proposed regulations calling for more consultation with customers would increase the costs of drugs.

It is clear that unique and interesting issues exist in pharmacy education. This chapter of the Health Sciences Education Plan will attempt to sort them out.

ADEQUACY OF THE EDUCATIONAL PROGRAM

In looking at various measures of the size of the educational programs in pharmacy, it is quickly apparent that the data are less complete than for other health fields. This situation reflects the fact that pharmacy has not been in the limelight as a subject of review by educators or State educational planners, and also the fact that the Higher Education General Information Survey (HEGIS) does not provide the same detailed data on pharmacy as it does for medicine and dentistry.

Output of Pharmacy Schools

Table P-1 displays the number of graduates of the four pharmacy programs in California since 1966.

TABLE P-1

Degrees Conferred by California Schools

School/Program	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
UCSF, Pharm. D.	80	62	79	71	81	86	83	78	84	84	61	91	85
USC, Pharm. D.	99	93	122	82	96	114	99	113	131	121	126	142	140
UOP, Pharm. D.	3	3	2	1	22	30	36	91	130	152	165	137	133
UOP, B.S.	42	59	62	56	78	71	60	127	62	43	45	61	46
Total	224	217	265	210	277	301	278	409	407	402	397	431	407

Source: John Wong Report, supplemented by HEGIS.

The number of pharmacy graduates has almost doubled since 1966, with most of the growth occurring in the Pharm. D. programs of the two independent institutions. While the total output of the four-year programs in California shows upward trend overall, there is considerable variation from year to year, more so than in other health science education programs.

Enrollment in Pharmacy Programs

Table P-2 displays fall enrollments in the four California pharmacy programs. These data obviously are incomplete for the independent institutions.

TABLE P-2

Enrollments in Professional Pharmacy Programs

Institution/ Program	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
UCSF, Pharm. D.	353	362	378	386	399	417	450	443
USC, Pharm. D.	-	-	-	532	573	-	603	609
UOP, Pharm. D.	-	-	-	-	-	-	440	NA
UOP, B.S.	-	-	-	-	-	-	151	NA
Total	353	362	378	918	972	417	1,644	NA

Source: UC Statistical Abstract, HEGIS, Institutions.

The Office of Health Affairs of the University of California reports that enrollments in pharmacy for the fall term are projected to reach 457 students in 1979, 468 in 1980, and remain at 468 in 1981. Similar projections are not available for the other pharmacy programs.

AUXILIARY PERSONNEL

Auxiliary personnel exist in the field of pharmacy in the form of pharmacy technicians. However, the status of such personnel is not defined legally and there are few training programs for them. To a large degree, future use of such personnel will depend upon how the professional pharmacist is utilized.

California, as previously noted, is unique in training pharmacists largely through the Pharm. D. degree program, even though State licensing laws have not been modified to provide for an expanded role for such graduates beyond that of the baccalaureate program. The Health Manpower Plan and other studies have suggested that this approach results in turning out a large number of underutilized—or, more negatively expressed, overeducated—pharmacists. There is widespread feeling that such well-educated pharmacists should be given an expanded role in health care, commensurate with the level of their professional training. However, there is little agreement about what that role should be.

One setting generally acknowledged to be appropriate for expanded-role pharmacists is the hospital, where pharmacists have become members of the primary care health team, performing such functions as consulting with physicians in determining appropriate medications and dosages, developing patient histories and profiles to avoid adverse reactions, and making rounds with hospital staff to insure that drug regimens are being carried out properly.

There are also settings in which pharmacists have been solo practitioners in primary care. The Indian Health Service of the U.S. Public Health Service, to counter a shortage of physicians, has trained pharmacist practitioners to examine patients, prescribe drugs and oral contraceptives, and treat chronic conditions. Physicians familiar with this program have viewed it favorably; criticisms have come largely from outside pharmacists.

The U.S. Public Health Service views pharmacists as uniquely equipped to carry out certain aspects of community health: immunization, family planning, venereal disease prevention, drug abuse prevention, health maintenance counseling, etc. Indeed, the corner drug store in an inner-city neighborhood serving as a source of primary health care is an exciting idea to contemplate. However, the necessary circumstances--including legal authorization--do not exist to experiment with such a concept at the present time.

If the professional scope of the Pharm. D. were to be expanded, the responsibility for the routine dispensing of prescriptions in a drug store might fall more heavily on the B.S. graduates trained in California and the much larger number of those trained in other states. The pharmacy technician could also play a major role in the dispensing of drugs under the supervision of a registered pharmacist.

In the Commission's Inventory of Academic and Occupational Programs, two Community Colleges report the existence of programs for pharmacy technicians; in each case the program is identified as "hospital pharmacy technology." An examination of the colleges' catalogs show that these programs tend to emphasize administrative procedures and practices, but require little or no understanding of biological processes as they are affected by drugs; e.g., no courses in chemistry or biology are required.

Under AB 1503, the experimental health manpower program, there have been several pilot projects to train extended-function pharmacy auxiliaries, but the programs seem to have elicited little interest on the part of the profession.[4] There are two inherent disadvantages in these experimental programs. First, there is no financial incentive for the educational institution to conduct such programs. Second, the institution cannot assure students that they will ultimately be allowed to employ their new, expanded abilities and knowledge, since there is no effective way to bridge the gap between the experimental program and the normal practice of pharmacy prescribed by current law and regulation. Another problem is that federal drug regulations may preclude the State's participation in experimental manpower programs dealing with the administration of drugs.

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[4] There have also been experimental manpower programs for expanded-role pharmacists, including current programs permitting pharmacists to prescribe. These programs are quite promising.

Nevertheless, there continues to be interest in the concept of the pharmacy technician. The California Pharmacists Association reports that it intends to seek introduction of legislation in 1979 recognizing the role of the pharmacy technician.

EDUCATIONAL OPPORTUNITY

Of the five health science fields at the University of California, pharmacy appears to be the least competitive in terms of the number of students admitted per number of applications received. In 1975, the School of Pharmacy received 556 applications for admission. Out of that group, 108—or 19.4 percent of the applicants—were admitted, a ratio of almost one in five. Two years later, in 1977, 20.7 percent of the applicants were admitted.

One should be cautious in generalizing about these ratios however. Even though acceptance ratios for pharmacy do appear to be higher than those in the University's other health sciences fields, there are circumstances which make such comparisons unwise. For instance, there is only one School of Pharmacy in the University, while there are five Schools of Medicine. Also, several of the other health science disciplines are characterized by multiple applications: for example, California applicants submitted an average of thirteen applications each to medical schools in a recent year, and an average of eight applications each to dental schools. These multiple applications produce deceptively low acceptance ratios for an individual institution—e.g., 3 percent for a medical school. The actual rate of acceptance of all applicants into the discipline, however, is much higher; for example, 30 percent of all Californians who apply to medical school are accepted either in California or another state. Thus, it is hard to generalize about the significance of a 20 percent acceptance ratio in pharmacy at a single campus without knowing what the total acceptance ratio into pharmacy is for Californians, a figure which is unavailable.

Other measures of educational opportunity, as identified in the John Wong Report, suggest that opportunities in pharmacy are not as good as they might be for students in a state which has 10 percent of the national population. For example,

- Of the seventy-two schools of pharmacy in the United States, only three are located in California;
- Only 5.8 percent of the pharmacy degrees awarded in the United States were awarded by California institutions;[5]
- California ranked thirty-ninth nationally in the ratio of pharmacy students to population;
- California ranked twenty-eighth nationally in the ratio of pharmacists to population; and
- More than half the pharmacists in California (54%) were trained out-of-state. (No reciprocity agreements with other states exist, so all out-of-state pharmacists practicing in California have passed the State examination.)

On the plus side, however, California seems to be trying to provide educational opportunity in pharmacy for its citizens. For example,

- Virtually all students in the State's three pharmacy schools are Californians;
- About 94 percent of the Californians enrolled in pharmacy schools nationally attend one of these three schools; and
- Recent entering classes in pharmacy are much more heterogeneous by sex and ethnicity than is the existing population of practicing pharmacists in the State.

Characteristics of Pharmacy Personnel

	1975-76 Entering Class	1973 Survey of Working Pharmacists
Caucasian	58.1%	82.0%
Asian	22.2	12.7
Chicano	5.7	1.7
Black	4.2	1.9
Other	9.8	1.7
	100.0%	100.0%
Male	62.4%	88.0%
Female	37.6	12.0

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[5] Nationally, at the time of the John Wong Report, California's share of the B.S. degrees awarded in pharmacy was less than 1 percent, but its share of the Pharm. D. degrees awarded was over 99 percent! In 1978, California institutions still awarded more than 98 percent of the Pharm. D. degrees awarded as first-professional degrees. However, there were a growing number of Pharm. D. degrees awarded as other than first-professional degrees--a number equal to slightly more than half the total of the California first-professional degrees.

No career ladders exist in pharmacy, and no attention is given in statute or in regulation to experience as an alternative to any of the educational requirements for licensure. Provision exists for the evaluation of foreign-trained pharmacists seeking licensure. If the applicant has "sufficient and equivalent education in pharmacy," as certified by the Board, the Board of Pharmacy permits the applicant to take the license examination. A rather unusual procedure is used to assess the adequacy and equivalency of the foreign applicant's education. A private organization, the Credentials Evaluation Service of Los Angeles, evaluates the applicant's transcript, and its recommendations become the basis for the Board's determinations of eligibility for the examination. There is also a special educational program at the University of California, San Francisco, to assist foreign-trained pharmacists to meet the requirements of the California license examination.

SPECIAL CONSIDERATIONS

Quite possibly the public and the profession have different perceptions of what role pharmacy should play in health care. In medicine and dentistry, there is a single perception, which is dictated by the profession; consumers have little or no choice but to accept the profession's practices and policies, including pricing, whether they agree with them or not. But in pharmacy the public in recent years has come to expect certain consumer rights, such as competitive pricing, which may be unpopular within the profession. Indeed, having a prescription for a generic drug filled at a discount drug store may be perceived by the consumer as the only way he or she can exercise any control today over the costs of health care.

In the past, the scope and direction of health care delivery have been determined primarily by the health professions themselves. In recent years, however, such practices have been increasingly questioned, as consumer advocates have asserted their legitimate interest in the formation of public policy in health care. Perhaps in this and other plans concerning the training and utilization of health professionals, planners and public policy makers should give greater attention to the expressed interests and concerns of the consumer.

It is also possible that within the profession there are differences of opinion about the role of the retail pharmacist. While the California Pharmacists Association has expressed its interest in an expanded role for pharmacists, without being specific about what it might be, it is difficult to know whether this point of view reflects strong consensus within the profession. The State Board of Pharmacy has decided to move ahead more specifically on one aspect of an expanded role for pharmacists, but has been thwarted by a chain drug store corporation.

The Board, over the veto of the Director of Consumer Affairs, adopted new regulations in September 1978 that established new requirements for pharmacists in order to provide greater assistance to consumers. One requirement was to "orally explain to the patient or the patient's agent the directions for use and any additional information deemed necessary for the pharmacist to promote the appropriate utilization of the medication or device prescribed." Another requirement was that pharmacists must set up a toll-free number for consumer information if they deliver more than half their prescriptions outside the pharmacy. These regulations were to go into effect on January 1, 1979.

In late December of 1978, a Sacramento-based retailing firm filed a lawsuit against the proposed regulations, and a Superior Court judge issued a temporary restraining order prohibiting their implementation. The company argued that the language of the section on oral explanations was ambiguous, and that pharmacists already provided appropriate explanations. It also objected to the requirement for a toll-free telephone number. The company asserted that the regulations imposed additional costs of doing business, one estimate being an additional cost of between 10 and 20 percent.

FINDINGS

1. The number and size of the educational programs in pharmacy in California are adequate to meet the needs of the State, given current patterns in in-migration and no marked change in the number of prescriptions filled.
2. There is no State-supported B.S. program in pharmacy for those students who wish to take this educational path to licensure in preference to the Pharm. D. degree route.
3. The pharmacy technician is not defined in statute or regulation; therefore, educational programs in this field are necessarily imprecise and undeveloped.
4. Some of the proposed changes in the role of the pharmacist may result in higher drug costs for the consumer, although these costs may be offset by a reduction in the use of prescription drugs, a circumstance which may also reduce iatrogenic illness.

CLINICAL UTILIZATION

Clinical experiences in pharmacy are provided in hospitals and pharmacies as a part of the professional training. These experiences include internships which are required by statute for licensure. These internships, which may or may not be salaried, consist of

1,500 hours of practical experience supervised by a preceptor who is a licensed pharmacist; thus, any pharmacy in the State is a potential training site. The law defines an intern pharmacist as a person who has completed the educational requirements for licensure, but the Pharmacy Board reports that internship hours can be accumulated anytime after the freshman year of professional pharmacy education.

RECOMMENDATIONS

1. The State should provide in statute and regulation for the delineation of function between a professional pharmacist and a pharmacy technician, and should provide appropriate educational programs in each field, taking into account the variety of roles which pharmacists may fill, ranging from traditional retail dispensing of drugs to the delivery of primary health care.

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CHAPTER V

OPTOMETRIC EDUCATION

Two institutions in California offer professional programs in optometry: the School of Optometry at the University of California, Berkeley, and the Southern California College of Optometry, a private institution in Fullerton. Nationally, there are only thirteen schools of optometry; thus, California appears to have more than adequate institutional resources for optometric education.

The Health Manpower Plan contains statistical data on the number of optometrists now practicing, and the projected need for optometric manpower. However, the Plan makes no formal findings or recommendations concerning the profession.

In 1975, at the request of the Legislature, the Postsecondary Education Commission conducted a study of optometric education, concluding that the State's needs for optometric manpower were being well met by the present programs. As a result of that study, and recent Commission participation in the current Regional Optometric Education Project of the Western Interstate Commission for Higher Education (WICHE), the information available on optometric education is more than sufficient for planning purposes.

The vision care field can be a confusing subject to study because of the variety of occupational titles within the field and the overlap between the occupations: optometrist, ophthalmologist, and optician. The following definitions are offered to differentiate in a general way the work of these three professions, and are not intended to be comprehensive definitions.

Optometrists are licensed health professionals who are graduates of a four-year professional training program leading to the degree, Doctor of Optometry, or O.D. They are trained in optics, the measurement of the eye, and the correction of refractory problems through the fitting of lenses, which they frequently dispense themselves. They are also trained to detect abnormalities or pathologies of the eye, for the treatment of which patients are then referred to physicians, and to carry out various kinds of vision therapy.

Ophthalmologists are physicians who specialize in the eye. They sometimes function in the same way as optometrists, fitting lenses, and occasionally dispensing glasses and lenses. They are authorized by their medical license to provide all aspects of vision care including surgery. Today, ophthalmologists are likely to have completed a formal three-year residency in that field, including training in

158

about eight major areas of knowledge, including optics and refraction.[1]

Opticians, or dispensing opticians as these registered professionals are designated in California, are the technologists who make glasses and lenses to order for optometrists and ophthalmologists, and then retail these products to patients. There is no educational requirement for this license, but five years of experience is required, some credit for which can be obtained from taking Community College courses in optical technology.

ADEQUACY OF PROGRAM

The adequacy of California's two educational programs in optometry can be assessed by examining measures of output and enrollment.

Output of Programs

Table O-1 (page 146) shows the number of California graduates with first professional degrees in optometry since 1966. The virtual absence of graduates in 1969 marks the conversion from a three- to a four-year curriculum.

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[1] An officer of the California Association of Ophthalmology reports that nationally 75 percent of ophthalmologists are board certified, and another 15 percent are "board eligible." It should be noted that specialized competence in medicine is not certified by the State; specialization is, instead, recognized through private channels of the medical profession. In a narrow legal sense, under a California license as physician and surgeon, a physician can treat any disorder; as a practical matter, most physicians choose to specialize. Although specialization increasingly reflects formal postgraduate medical education, a physician can identify himself as a specialist whether or not he or she has had formal residency training or is board certified. However, there are practical limitations--in the form of peer review, hospital privileges, malpractice insurance, etc.--which militate against marginally qualified persons functioning as specialists.

TABLE O-1

O.D. Degrees Conferred by California Schools and Colleges of Optometry 1966 - 1977

School	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
UC, Berkeley	26	29	43	1	39	33	48	44	57	52	60	57	61
Southern California College of Optometry	33	52	53	0	49	52	59	57	61	58	63	84	62
Total	59	81	96	1	88	85	107	101	118	110	123	141	123

Source: John Wong Report, updated through HEGIS.

The output of these programs continues to grow, although there are minor year-to-year fluctuations.

Enrollment

Table O-2 depicts the enrollment in the first professional (O.D.) degree programs in optometry.

TABLE O-2

Fall Enrollments in Professional Programs in Optometry

	Actual							Projected			
School	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
UC, Berkeley	232	238	251	261	270	257	257	295	300	300	300
Southern California College of Optometry	-	314	367	371	390	397	387	397	397	397	397

Source: John Wong Report, updated by HEGIS; Projections from institutions.

It appears that enrollment growth has been somewhat faster in the Southern California College of Optometry (SCCO) than in the University of California. The University's program has been limited by physical capacity; recent expansion of this capacity, however, will permit the College of Optometry to increase its enrollment to a total of 310 students. Southern California College of Optometry has already reached capacity at its relatively new campus.

MID-LEVEL PRACTITIONERS

In optometry the mid-level practitioner is the optometric technician, which is at present an unlicensed occupation in California. By its nature, and indeed even by the name of the profession, optometry traditionally has been largely a field of measurement and correction of visual optics, a field that can be served in part by the technologist or technician. Even as the profession is moving toward a broader role for the optometrist as a primary care health professional, the work of prescribing, fitting, and dispensing lenses remains the core of the daily work in an optometric office. Much of this work can be performed by a technologist or technician. Training in schools of optometry today often includes the concept of the health care team which includes a technician, and many young optometrists view the use of technicians as an effective way to increase the productivity of their practices.

Employment in the optical industry is also an important outlet for trained optometric technicians. Officials at SCCO report that the graduates of their one-year technician program are aggressively recruited by the optical profession.

In addition to the program at SCCO, optometric technician programs exist at several Community Colleges. These programs vary in emphasis and even in name. The most comprehensive programs are identified as ophthalmic dispensing; these two-year programs exist at Cañada College and Crafton Hills College, and include technical work in making lenses as well as training in the support of an optometrist in an office, including the measurement of eyes for glasses. Citrus College separates the major emphasis into two programs: (1) an ophthalmic technology certificate program which produces auxiliary personnel for work in an optometrist's office, including the measurement of eyes for glasses, and (2) a certificate program in optics which trains personnel for the optical industry. Two other programs train personnel only for the optical industry, the two-year ophthalmic optics program at Los Angeles City College, which is designed to produce opticians, and the certificate program in optical technology at Santa Rosa Junior College, which also concentrates on the production of lenses. In addition, there are two programs which train optometric assistants for work in an optometrist's office, but without the technical background in optics/measurement; these programs are identified as optometric technician at Merritt College and optometric assistant at San Diego City College. Finally, there are four technician programs in private career schools: the American College of Optics, the Valley College of Medical and Dental Careers, and Northwest College of Medical and Dental Assisting, each in Los Angeles, and the San Diego College of Medical and Dental Assistants.

There are also apprenticeship programs which train lens grinders, preparing personnel for employment in the optical industry or as dispensing opticians.

EDUCATIONAL OPPORTUNITY

Like other health science fields, optometry is a profession which is attractive to many people; thus, admission to optometric education is highly competitive. In 1977, Southern California College of Optometry admitted 96 students from an applicant pool of 702, an acceptance rate of 13.7 percent. This group included 25 out of 291 California applicants, an acceptance rate of 8.6 percent. The same year the University of California admitted 65 students from 550 applicants, an acceptance rate of 11.8 percent. This group included 57 out of 430 California applicants, an acceptance rate of 13.3 percent.

In each case there were duplicate applications. Many applicants may also have applied to Pacific University in Oregon, which admitted 85 out of 747 applicants, slightly more than one in ten. Thus, for those students from California who wished to enter optometry school, the mathematical chances of getting into any of the three optometry schools on the West Coast were no better than one in seven at any of the schools. Actually, the odds dropped considerably at the two private institutions because of their admissions policies, which include contracting with other states through WICHE to reserve seats for students from those states. As a result, at Southern California College of Optometry only 31 percent of its total spaces were occupied by Californians, compared to 89 percent at the University of California. Additional opportunities exist at Pacific University where 10 percent of the student body in optometry is from California. Comparing the 1977 ratios of California-applicant success at the three schools (as reported above) to the number of first-year seats at each institution, it appears that there were about 90 seats available to accommodate the Californians who sought admission, perhaps 450 applicants in all.

Thus, in spite of having two of the nation's thirteen optometry schools and 14 percent of the first-year seats in optometric education, California is still a very competitive state for those seeking training in this field. However, about 80 percent of the optometrists practicing in California have been trained in-state, so the profession is not crowded with people who received their training elsewhere, as in medicine. As a result, there is no pressure--as there is in medicine--to restrict the entry of additional students into training programs solely because of near-surpluses in manpower attributed to in-migration.

Concern was expressed several years ago that opportunity for optometric education for Californians would further decline as Southern California College of Optometry began to contract with other states to reserve seats for students. In 1974, SCCO sought legislative support for a contract program with the State of California, arguing that such a program was necessary to meet California's manpower needs in optometry. The bill embodying this concept contained an appropriation for contracts at the rate of $4,000 per student per year; it passed the Assembly, but was defeated in the Education Committee of the Senate.

A resolution was then adopted in the Assembly, calling for the Postsecondary Education Commission to review the ability of the institutions of optometric education to meet the manpower needs of the State. Early in 1975, the Commission adopted a report which determined that such needs would be adequately met in the near future, even if California had somewhat fewer practicing optometrists. This report specifically recommended against the proposed contract program.

It is too early to tell if the optometric manpower situation in California has been affected noticeably by the decision of SCCO to contract with other states for student spaces, and the decision of the State of California not to enter into such a contract. However, it may well be true that there are fewer Californians receiving optometric education within the State today than there were in 1970, when SCCO's entering class was 75 percent Californian.

SPECIAL CONSIDERATIONS

With only thirteen institutions in the United States, optometric education is a small enough field to be studied thoroughly. Likewise, the profession's membership is small, with only about 3,200 optometrists in California, so that it too is relatively easy to monitor.

Such monitoring indicates that optometrists, like pharmacists, aspire to become more broadly involved in primary health care. However, special circumstances make it difficult to predict how extensive or how advantageous an expanded role might be. For example, there is no program in pharmacy, such as those under AB 1503, through which new occupational roles can be developed experimentally. Also, unlike pharmacists, and dentists as well, optometrists share their special expertise with another profession, the medical specialty of ophthalmology. Ophthalmologists are authorized to do all that optometrists do, as well as engaging in surgical and medical procedures. Thus, both groups provide primary vision care, with the result that a certain degree of competition exists between them.

The principal argument for expanded primary care responsibilities for optometrists is their geographical distribution and availability. Optometrists are not only more widely distributed geographically than are ophthalmologists, but there are perhaps twice as many in California.[2]

The fact that the training of optometrists costs considerably less than that of ophthalmologists (as one might expect, since optometry is a narrower, more specialized field) is another argument for their greater use in primary care. However, there seems to be no evidence to bear out the assumption that the same vision care delivered by an optometrist is cheaper than that provided by the ophthalmologist. The Medi-Cal section of the Department of Health Services is conducting a survey of the fee schedules in optometry, but the survey will not compare optometric fees to ophthalmic fees. However, this office reports that during the past six months the fees charged for complete eye examinations with refraction and tonometry have averaged $32.23 for optometrists and $40.00 for ophthalmologists, with Medi-Cal reimbursement being $30.80 to the optometrist and $32.00 to the ophthalmologist. On this basis, the cost of the same procedure from an optometrist appears to be 20 percent less than from an ophthalmologist. Reportedly, an earlier survey of these comparative fees showed the opposite relationship.

A recent report of the Health Resources Agency of the federal Department of Health, Education, and Welfare estimates that "about nine out of ten of the patients who need vision care services require services which are within the present scope of optometry."

The report also notes that about two-thirds of the population now seek vision care from optometrists and one-third from ophthalmologists, which suggests that more people could utilize optometrists if they wished. However, the relative advantages of seeing one type of vision specialist over the other seem to be rarely discussed in the literature of health planning.

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[2] The 1978 Blue Book of Optometry reports 3,209 licensed optometrists living in California. If 88 percent were active, as was the case in 1976 when the John Wong Report studied optometry, there were about 2,824 practicing optometrists in California in 1978. The number of ophthalmologists in California in 1977 totaled 1,469, according to the Division of Health Professions Development of the Office of Statewide Health Planning and Development. Another 195 physicians were in residency programs in ophthalmology. Thus, the ratio of optometrists to ophthalmologists in California is approximately two to one.

FINDINGS

1. The two optometric programs in California are adequate to meet the manpower needs of the State for the near future, provided that a significant number of Californians continue to be admitted to the Southern California College of Optometry.

2. Educational opportunity in optometry in the State would be impaired seriously if the Southern California College of Optometry were to reduce significantly the number of Californians admitted each year.

ADEQUACY OF CLINICAL SITES

Clinical experience is important in optometric education. California is fortunate that its two optometry schools are located in major population centers, making the institutions' clinical outreach a valuable health care resource to large numbers of people.

Southern California College of Optometry operates regular clinics on its Fullerton campus and in downtown Los Angeles. It also operates twenty-three small clinics in Southern California, Arizona, Nevada, and New Mexico, as well as on West Coast military bases.

The University of California's clinical outreach is not as extensive. In addition to the on-campus clinic at Berkeley, the College of Optometry operates clinics in Daly City, in a nearby Veteran's Administration hospital, and in the Lions Club Blind Center in Oakland.

RECOMMENDATIONS

1. The State should include optometry in the AB 1503 experimental health manpower programs in order to explore possible new roles for optometrists in primary health care, and for optometric technicians in patient care.

2. Future health manpower plans prepared by the Office of Statewide Health Planning and Development should investigate the overlapping responsibilities of optometrists and ophthalmologists in providing vision care, and should recommend public policies with respect to the utilization of each kind of vision specialist.

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CHAPTER VI

EQUAL EDUCATIONAL OPPORTUNITY

During the development of its Health Sciences Education Plan, the Commission has found that certain ethnic groups and women are, by most measures, underrepresented in health sciences education and in the health professions. The Health Manpower Plan issued by the Office of Statewide Health Planning contains a similar finding with respect to ethnic minorities, but does not address the underrepresentation of women in the health professions. The Health Manpower Plan treats such ethnic underrepresentation as a lack of manpower which is sensitive to the health needs of minorities. From its perspective, the Commission regards this underrepresentation as a lack of educational and career opportunities for a sizable number of Californians, both male and female.

To examine the extent of this underrepresentation, this chapter of the Commission's Plan will indicate via a number of tables the composition, by sex and ethnicity, of recent graduating classes and the current enrollment in professional educational programs in the five health fields covered in the preceding Plan. Comparisons will also be made between: (1) the composition of groups of students and graduates in the health sciences, and the composition of the general population in California; (2) the composition of the group of recent college graduates who are likely to be applicants for admission; and (3) the composition of the professional health work force. This chapter also reviews current efforts to increase the number of ethnic minorities and women in professional education in the health sciences, and recommends additional efforts which seem needed.

Two caveats concerning the data displayed in this chapter should be noted. First, data are available for only three years, 1976, 1977, and 1978--the only years included in the files of the Commission's information system. Little in the way of trends can be established on the basis of three years of data, and any judgments concerning "progress" in that time must be tempered by this circumstance.

Second, the data have built-in opportunities for inaccuracy. Sex and ethnicity data are reported voluntarily by individual students through the Higher Education General Information Survey (HEGIS). Students may identify themselves in any way they wish, or they may choose not to respond at all. There are also problems in making the data comparable. For independent California institutions, the sex and ethnicity data are collected by the Commission in the HEGIS format, which contains five ethnic categories and a cagegory of "Non-Resident Alien." For the State's public institutions, the Commission collects sex and ethnicity data in nine categories, the three additional categories being "Filipino," "No Response," and "Other." To consolidate these data into the HEGIS format it is necessary to add "Filipino" totals to the "Asian/Pacific Islander" category, and to prorate the "No Response" and "Other" data among the six HEGIS categories. (The independent institutions have already prorated the "No Response" and "Other" data via their HEGIS reports.) The data for the two sectors has thus been made as simple to compare as possible and in the exact format in which it will be reported to the federal government—even though there may be some question concerning the accuracy of the results obtained by prorating. 1/

Two basic tables have been prepared for each of the five health fields: one shows degrees awarded; the other shows enrollment by sex and ethnicity. A third table shows the relationship of each ethnic and sex group to total degrees and enrollment, as compared to the other measures cited earlier: total population; recent college graduates (a useful standard since people must have reached this point to be eligible for most professional education); and the work force of each profession. A series of interpretative comments is also offered, subject to the caveats noted above.

MEDICINE

Table MO-1 shows the composition of the graduating classes in medicine, by sex and ethnicity, for California institutions in 1976, 1977, and 1978.

The distribution of enrollment in medicine, by sex and ethnicity, for California institutions for the same three years is shown in Table MO-2.

Table MO-3 shows the relationship between the distribution of degrees awarded and enrollment, as reflected in the two previous tables, compared to: (1) the distribution of the California population, by sex and ethnicity; (2) the eligibility pool for medical schools, as defined by recent college graduation; and (3) the current work force of physicians.

1/ The percentage of students in the "No Response" or "Other" categories ranges from zero to about 15 percent in the various tables which have been prorated in this chapter, with perhaps 10 percent being a median figure. Thus, in a table of one hundred students, ten of whom are in the two categories of unknown ethnicity, the ten students would be prorated into the other six categories according to the percentage that each category represents of the ninety students whose ethnicity is known.

TABLE MO-1

Degrees Conferred Medicine, By Sex and Ethnicity

	Non-Resident Alien		Black Non-Hispanic		American Indian/ Alaskan Native		Asian/ Pacific Islander		Hispanic		White Non-Hispanic		Total		All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCD															
1976	0	1	2	3	0	1	8	2	2	3	54	23	66	33	99
1977	2	0	5	1	0	0	18	2	5	0	51	17	81	20	101
1978	0	0	2	1	1	0	8	1	6	0	46	24	63	26	89
UCI															
1976	2	2	0	0	0	0	5	0	1	0	52	12	60	14	74
1977	2	0	3	0	1	0	7	1	4	0	51	14	67	15	82
1978	1	0	7	2	1	1	4	0	3	2	45	11	61	16	76
UCLA															
1976	2	2	2	1	0	0	13	0	6	2	114	16	137	21	158
1977	0	1	6	2	1	0	16	2	5	1	104	20	132	26	158
1978	1	0	5	2	2	0	11	1	15	2	95	18	129	23	152
UCSD															
1976	0	1	3	2	1	0	3	0	5	1	36	13	48	17	65
1977	2	1	0	0	0	0	6	1	2	1	42	4	52	7	59
1978	0	0	3	0	0	0	3	1	2	0	59	20	67	21	88
UCSF															
1976	1	0	8	3	0	0	15	4	5	1	91	28	120	36	156
1977	0	1	12	2	1	0	7	1	6	4	75	30	101	38	139
1978	0	0	7	2	0	0	14	1	6	4	70	44	97	51	148
UC TOTAL															
1976	5	6	15	9	1	1	44	6	19	7	347	92	431	121	552
1977	6	3	26	5	3	0	54	7	22	6	323	85	433	137	570
1978	2	0	24	7	4	1	40	4	32	8	315	117	417	137	554
LOMA LINDA															
1976	13	1	3	0	1	0	7	0	3	1	110	18	137	20	157
1977	8	2	4	1	1	0	7	2	2	0	109	15	131	20	151
1978	7	2	8	0	1	0	2	1	1	1	98	22	117	26	143
STANFORD															
1976	0	0	2	0	0	0	0	0	4	0	50	16	56	16	72
1977	2	0	3	2	1	0	2	3	9	1	63	21	80	27	107
1978	2	0	10	0	1	1	4	0	6	3	46	21	69	25	94
USC															
1976	0	0	4	0	0	0	5	3	5	0	77	19	91	22	113
1977	0	0	2	0	0	0	5	1	7	1	94	24	108	26	134
1978	1	1	1	2	1	0	4	1	7	1	92	25	106	30	136
PRIVATE TOTAL															
1976	13	1	9	0	1	0	12	3	12	1	237	53	284	58	342
1977	10	2	9	3	2	0	14	6	18	2	266	60	319	73	392
1978	10	3	19	2	3	1	10	2	14	5	236	68	292	81	373
GRAND TOTAL															
1976	18	7	24	9	2	1	56	9	31	8	584	145	715	179	894
1977	16	5	35	8	5	0	68	13	40	8	589	145	752	210	962
1978	12	3	43	9	7	2	50	6	46	13	551	185	709	218	927

TABLE MO-2

Fall Enrollment, Medicine, By Sex and Ethnicity

	Non-Resident Alien		Black Non-Hispanic		American Indian/ Alaskan Native		Asian/ Pacific Islander		Hispanic		White Non-Hispanic		Total		All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCD															
1976	5	0	20	4	2	0	39	16	21	4	190	104	277	128	405
1977	11	4	16	8	3	0	29	15	20	5	190	101	269	133	402
1978	10	5	14	7	2	0	31	16	13	4	201	103	271	135	406
UCI															
1976	10	0	21	9	5	1	14	3	35	7	163	40	248	60	308
1977	15	0	19	11	3	1	8	1	32	11	153	39	230	63	293
1978	10	2	22	17	0	0	8	3	41	7	166	36	247	65	312
UCLA															
1976	2	2	20	6	3	0	43	5	49	8	362	98	479	119	598
1977	4	2	21	11	2	0	43	7	47	11	332	102	449	133	582
1978	7	6	20	14	0	0	50	11	34	14	333	106	444	151	595
UCR															
1976	Not operational until 1977														
1977	0	0	0	0	0	0	0	4	0	0	12	0	12	4	16
1978	0	0	0	0	0	0	5	3	0	0	22	5	27	8	35
UCSD															
1976	5	1	7	2	0	1	28	9	17	2	221	47	278	62	340
1977	3	0	8	3	0	1	33	13	17	1	237	64	298	82	380
1978	6	0	8	3	1	1	44	12	25	4	249	67	333	87	420
UCSF															
1976	0	1	32	20	3	0	53	14	56	19	244	148	388	202	590
1977	1	0	28	19	0	1	65	19	58	20	248	154	400	213	613
1978	1	1	22	23	2	0	61	23	53	22	260	158	399	227	626
UC TOTAL															
1976	22	4	100	41	13	2	177	47	178	40	1180	437	1670	571	2241
1977	34	6	92	52	8	3	178	59	174	48	1172	460	1658	628	2286
1978	34	14	86	64	5	1	199	68	166	51	1231	475	1721	673	2394
LOMA LINDA															
1976	22	3	24	4	1	1	21	6	6	2	381	101	455	117	572
1977	39	10	22	5	0	1	23	7	6	2	378	95	468	120	588
1978	39	9	17	7	0	1	37	13	7	1	402	109	502	140	642
STANFORD															
1976	5	3	27	8	5	4	9	7	21	9	183	71	250	102	352
1977	5	2	26	11	6	4	12	8	21	10	180	77	250	112	362
1978	7	3	15	14	6	3	15	9	20	9	174	65	237	103	340
USC															
1976	3	0	10	3	0	0	31	9	31	0	361	93	436	105	541
1977	6	1	12	8	2	2	29	10	42	4	370	85	460	111	571
1978	5	0	14	10	1	2	39	11	38	5	383	79	480	107	587
PRIVATE TOTAL															
1976	30	6	61	15	6	5	61	22	58	11	925	265	1141	324	1465
1977	50	13	60	24	8	7	64	25	69	16	928	257	1178	343	1521
1978	51	12	46	31	7	6	91	33	65	15	959	253	1219	350	1569
GRAND TOTAL															
1976	52	10	161	56	19	7	238	69	236	51	2105	702	2811	895	3706
1977	84	19	152	76	16	10	242	84	243	64	2100	717	2836	971	3807
1978	85	26	132	95	12	7	290	101	231	66	2190	728	2940	1023	3963

TABLE MO-3

Comparison of Medical Students and Graduates to Other Populations, by Sex and Ethnicity

	Ethnic Groups					Sex	
	Black	Hispanic	Asian	American Indian	White	Male	Female
Total California Population 1976	7.7%	15.8%	3.7%	.5%	71.5%	49.8%	50.2%
B.S. Degrees Awarded in California 1977	4.6	4.9	6.9	.8	79.9	55.3	44.7
Medical School Enrollment 1978							
UC	6.3	9.1	11.2	.3	71.3	71.9	28.1
Private	4.9	5.1	7.9	.8	77.2	77.7	22.3
Total	5.7	7.5	9.9	.5	73.6	74.2	25.8
M.D. Degrees Awarded 1978							
UC	5.6	7.2	7.9	.9	78.0	75.3	24.7
Private	5.6	5.1	3.2	1.0	81.5	78.3	21.7
Total	5.6	6.3	6.0	1.0	79.4	76.5	23.5
Practicing M.D.s in California	2.0	.8	3.7	.1	90.3	92.3	7.7

Source: Population Data from Department of Finance: Physician Data from Board of Medical Quality Assurance 1976 Questionnaire.

From the three tables, the following relationships seem worthy of note for the groups indicated.

Black

The number of Black graduates in medicine has increased significantly—58 percent in just two years. In 1978, Blacks received 5.6 percent of the total degrees awarded, with public and private institutions awarding the same percentage. Between 1976 and 1978, California's independent medical schools registered the greatest gains in degrees awarded to Blacks.

Blacks constituted 5.7 percent of the State's total medical school enrollment in 1978; in the University of California they represented 6.3 percent. Enrollment of Black men is declining in both segments, while that of Black women is increasing rapidly. Women now constitute 41.9 percent of the Black medical enrollment, the highest percentage of women medical students in any ethnic group. However, in degrees conferred, the lead of Black men over women continues to grow. The highest Black enrollment in medicine (12.5%) is at the University of California, Irvine; the lowest (2.6%) is at the University of California, San Diego.

Hispanic

The number of degrees awarded to Hispanics—most of whom in California identify themselves as Chicanos—increased 51 percent between 1976 and 1978. Both the independent and public segments showed growth, with the University of California's somewhat greater. Chicanos now account for 6.3 percent of the degrees conferred, and 7.5 percent of the current enrollment in California medical schools. Enrollment of males is decreasing, but enrollment of Chicanas is increasing. The highest enrollment of this minority group (15.4%) is at the University of California, Irvine; the lowest is at the University of California, Davis (4.2%), in the public sector, and at Loma Linda University (1.2%), in the independent sector.

Asian

Asians are the only minority group whose members are represented in the medical profession in the same proportion as in the general population. Although the number of degrees awarded to Asians declined somewhat between 1976 and 1978, their enrollment in medical schools increased 27.4 percent during that period, including a 46.4 percent increase in the number of women. Asians constitute 9.9 percent of the current enrollment in medical schools, the largest portion of which is in the University of California. The highest Asian enrollment in four-year medical schools (13.4%) is at the University of California, San Francisco; the lowest (3.6%) is at the University of California, Irvine.

American Indian

This small minority group is surprisingly well represented in medical education, having received 1.0 percent of the degrees awarded in 1978 and representing .5 percent of the enrollment. Numbers are so small for this group that any generalization may be risky, but it appears that enrollment of American Indians has declined significantly between 1976 and 1978 while the number of degrees conferred has tripled. Women represent a sizable portion (36.8%) of that enrollment. Stanford University is the leader in Indian enrollment with 47.4 percent of those currently enrolled in California medical schools; it also graduated 22.2 percent of the American Indians who finished medical school in California in 1978.

Women

By several measures, women are the most underrepresented group in medicine. Women are particularly underrepresented in proportion to the number who recently have obtained bachelor's degrees, perhaps the most basic measure of eligibility for professional education. Enrollment of women is increasing faster than total medical school enrollment in California; between 1976 and 1978 their enrollment grew by 14.3 percent, compared to an overall 6.9 percent increase. (The increase was even greater in the University of California.) Because the enrollment base is much smaller, however, the total number of women is still much smaller than that of men. In the University of California, the highest percentage of women enrolled in medical school (36.7%) is at the San Francisco campus, and the lowest (20.7%) is at the San Diego campus. In the private sector, Stanford enrolls the most women (19.1%), and the University of Southern California, the fewest (13.5%).

General Assessment

Measured on the basis of recent college graduating classes, most ethnic minorities are reasonably represented in medical school. American Indians are slightly underrepresented, but women are significantly underrepresented. Measured on the basis of the composition of the State's total population, Blacks, Chicanos, and women are underrepresented in medical schools, although Black underrepresentation is much less severe. On the same basis, Asians and whites are overrepresented in medical schools. American Indians are represented in the same proportion in medical schools as in the general population.

The lack of data covering more than three years makes it difficult to assess progress in achieving a more representative distribution by sex and ethnicity in medical school enrollment, but some significant comparisons are possible. Considering the fact that the proportion of minority students enrolled in medical school in California generally exceeds the proportion of those in recent college graduating classes (Table MO-3) and considering the fact that a somewhat higher percentage of minority applicants is admitted to medical school in California than white applicants (Tables M-15a and M-15b, Chapter I), it seems reasonable to conclude that the number of minority students admitted to medical school is in direct proportion to the number graduating from college and applying to medical school. Achieving greater minority enrollment in medical school would thus appear to depend initially on achieving greater minority enrollment at the undergraduate level.

For women, the opposite is true. Their share of degrees awarded in recent years approaches their proportion of the general population, but they have not been enrolled in medical schools in a similar proportion. Furthermore, as Table M-13 in Chapter I indicates, the ratio of California women who succeed in gaining admission to medical school is no better than that of all applicants. Growth in their enrollment, however, is currently rapid enough to suggest a significantly larger share soon for women in medical school enrollment.

NURSING

Data on sex and ethnicity are somewhat harder to obtain for nursing than for most of the other health fields. This difficulty is attributable to the fact that the Higher Education General Information Survey (HEGIS), the primary information source for this Plan, does not provide the necessary discreteness at the baccalaureate or associate degree level to identify nursing students. The Commission's information system contains data for the public four-year nursing programs, but none for independent institutions and two-year programs.

Table NO-1 shows baccalaureate degrees conferred in nursing, by sex and ethnicity, in California public institutions for 1976, 1977, and 1978. Omitted from this table are those programs which award degrees to nurses who have previously been licensed as R.N.s. Tables NO-1 and NO-2 are arranged in a ten-column non-HEGIS format, inasmuch as the data they contain are collected in this form from public institutions. No comparisons to programs in independent institutions are possible because of the lack of ethnic data for these programs.

Table NO-2 shows fall enrollment in nursing programs in public four-year institutions for 1976, 1977, and 1978.

TABLE NO-1: Degrees Conferred in Nursing, by Sex and Ethnicity, Public Four-Year Institutions

	Non-Resident Alien		Black Non-Hispanic		Amer. Ind./Alaska Nat.		Asian/Pac. Islander		Hispanic		White Non-Hispanic		Filipino		No Resp.		Other		Total		Total, All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCLA																					
1975-76		2		6				12		6	7	45		1				2	7	74	81
1976-77				3				7		3	1	30		1				3	1	47	48
1977-78								12		3	1	32		3					1	50	51
UCSF																					
1975-76				16		1	1	9	2	4	5	77	1	2	2	5		7	11	121	132
1976-77				8		1		16	1	2	15	80		1	3	10		3	19	121	140
1977-78				8		1	2	20	1	1	11	84		8		3		1	14	126	140
CSC, Bakersfield																					
1975-76			1	3				1	1	2	6	32							8	38	46
1976-77	1	3		1		1	1	3	2	3	7	33							11	44	55
1977-78	1	1					2	1		4	12	52	1			3			16	61	77
CSU, Chico																					
1975-76				3		1		1			3	74				8		1	3	88	91
1976-77				1				2		2	3	60				9		1	3	75	78
1977-78				1				2		3	3	62			1	34	1		5	102	107
CSU, Fresno																					
1975-76		4		2	1			5		6	3	91				1		1	4	110	114
1976-77				4		2		3	1	4	8	81			2	2		3	11	99	110
1977-78		1		1		1	2	11		8	6	90				2		3	8	117	125
CSU, Hayward																					
1975-76		1		6		1		3			5	41		2		2		4	5	60	65
1976-77		2		2				1		1	5	56				2		4	5	68	73
1977-78		3		1		1					2	52		1				2	2	60	62
Humboldt State U.																					
1975-76						1		2			1	23				2			1	28	29
1976-77		1		1		2			1		3	17				6		3	4	30	34
1977-78										2	1	30							1	32	33
CSU, Long Beach																					
1975-76				7			1	8		2	1	69				4			2	90	92
1976-77		1		6		2	1	4		3	1	73				12		2	2	103	105
1977-78		1		6		1		10		6	2	87		1		17		1	2	130	132
CSU, Los Angeles																					
1975-76		2	2	22		2		20		19	1	84			1	8			4	157	161
1976-77			2	19				10	1	5	2	50				5			5	89	94
1977-78				22		1		16	1	14	4	125		2	1	13			6	193	199
CSU, Sacramento																					
1975-76		2		5	1	1		2		3	3	57			3	23			7	93	100
1976-77				1				2		3	4	47			1	12		4	5	69	74
1977-78		8		5			1	3	1	8	12	188		1	1	13			15	226	241
San Diego State U.																					
1975-76				3			1	1		1	14	75							15	80	95
1976-77							1				4	81				1			5	82	87
1977-78		1		1						3	1	91							1	96	97
San Fran. State U.																					
1975-76				8				7		1	1	47		2		2		2	1	69	70
1976-77			1	3		1		10				43		2		1		2	1	62	63
1977-78				2		1		12			5	54		4		2		4	5	79	84
San Jose State U.																					
1975-76		1		8		1		8	2	6		85		1		16		1	2	127	129
1976-77				4		1	1	10		1	2	74		1	2	14			5	105	110
1977-78				3				9			2	70		1	2	15		4	4	102	106
TOTALS																					
1975-76		12	3	89	2	8	3	79	5	50	50	800	1	8	6	71		18	70	1135	1205
1976-77	1	7	3	53		10	4	68	6	27	55	725		5	8	74		25	77	994	1071
1977-78	1	15		50		6	7	96	3	52	62	1017	1	21	5	102	1	15	80	1374	1454

TABLE NO-2: Fall Enrollment, Nursing, by Sex and Ethnicity, Public Four-Year Institutions

	Non-Resident Alien		Black Non-Hispanic		Amer. Ind./ Alaska Nat.		Asian/Pac. Islander		Hispanic		White Non-Hispanic		Filipino		No Resp.		Other		Total		Total, All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCLA																					
1976-77				7				25		8	2	76		4				1	2	121	123
1977-78				3				19		7		62		6		1				98	98
1978-79		1		5				9		13		63		3	1				1	93	94
UCSF																					
1976-77				16		2	2	38	3	5	29	161		11	3	14		3	37	250	287
1977-78		1	1	17		1	5	37	1	5	24	172		14		4		4	31	251	282
1978-79		2	2	15			3	39	2	9	27	170		11		7	3	4	37	247	284
CSC, Bakersfield																					
1976-77		3		1		1		1	1	6	7	44				2			8	58	66
1977-78		1						5	1	4	7	65		1		3			8	79	87
1978-79		4		1		1		6			4	64				5	1		5	81	86
CSU, Chico																					
1976-77				4			1	4		7	10	158			2	38	1	2	14	213	227
1977-78				3			1	2		7	10	152			2	43	1		14	207	221
1978-79				2		1				4	13	135			2	48		3	15	193	208
CSU, Fresno																					
1976-77				8		3	2	19	3	20	20	227			2	9		5	27	292	319
1977-78		2		4		2	2	15	1	15	15	180			5	30		4	23	252	275
1978-79	1	2	1	5		2	1	12	4	15	18	169	1	1	1	8	1	4	28	218	246
CSU, Hayward																					
1976-77		4		4		1		3		2	11	105		2		2	2	4	13	127	140
1977-78		5		1		2		3		2	10	91		2		1	2	3	12	110	122
1978-79		4		3		2		12		8	16	97		1		4			16	131	147
Humboldt State U.																					
1976-77				3		3			3	5	10	63			2	11		4	15	89	104
1977-78				5				1	2	4	14	87			3	8		1	19	106	125
1978-79				3		1		3	2	4	16	83			2	12		1	20	107	127
CSU, Long Beach																					
1976-77	2	15	2	38		6		19	2	13	18	251		1	1	39	1	6	26	388	414
1977-78		5		31		4	1	18	3	12	18	199		3	2	73	1	2	25	347	372
1978-79		2		25		5		13	3	14	16	205		11	1	51	1	7	21	333	354
CSU, Los Angeles																					
1976-77		5	1	123		3	5	57	5	52	16	376				16			27	632	659
1977-78		4	2	97		3	2	42	4	56	19	353		8	1	18			28	581	609
1978-79		4	1	86		4	2	62	3	52	22	343		5	6	50			34	606	640
CSU, Sacramento																					
1976-77	1			6	1	2		6		2	11	107			10	44	1	2	24	169	193
1977-78			2	18	2	2	2	18		12	24	222		2	13	73			43	347	390
1978-79	1			7	3		1	5	1	3	6	121			4	45		1	16	183	199
San Diego State U.																					
1976-77		1		9		1	1	4	1	9	13	244	1	1					16	269	285
1977-78		1		10		2	1	1		4	11	101			10	145			22	264	286
1978-79				10		4		7		10	14	126	1	2	3	51	2	25	20	235	255
San Fran. State U.																					
1976-77		2	1	12		2		27			4	122		9	2	31		6	7	211	218
1977-78		3		13		1		35		5	9	155		13	1	10		5	10	240	250
1978-79		1	1	15				30	1	4	13	157		19	1	9		4	16	239	255
San Jose State U.																					
1976-77				13			1	24	1	4	3	152		3	7	87		1	12	284	296
1977-78				8		1		18		5	7	137		5	5	47		3	12	224	236
1978-79				5				9		11	7	136		6	3	67		7	10	241	251
TOTALS																					
1976-77	3	30	4	244	1	24	12	227	19	133	154	2086	1	31	29	293	5	34	228	3103	3331
1977-78		23	5	210	2	18	14	214	12	138	168	1976		54	42	456	4	22	247	3106	3353
1978-79	2	20	5	182	3	20	7	197	16	147	172	1868	2	59	24	358	8	56	239	2907	3146

Comparisons to Other Populations can be made with respect to the sex and ethnicity of nurses, as shown in Table NO-3. The percentages for ethnic groups in this table do not add to 100 because "Non-Resident Alien," "Other," and "No Response" categories are not included. High school graduation, rather than college graduation, is used as the basis of the eligibility pool, inasmuch as nursing programs do not require a B.S. degree as a prerequisite. It should be noted, however, that the only demographic information available is for high school seniors, rather than high school graduates.

TABLE NO-3

Comparison of Baccalaureate Nursing Students and Graduates to Other Populations, by Sex and Ethnicity

	Black	Hispanic	Asian	American Indian	White	Male	Female
Total Calif. Population 1976	7.7%	15.8%	3.7%	.5%	71.5%	49.8%	50.2%
High School Seniors in Calif. 1973	7.9	12.7	3.1	.4	75.9	N/A	N/A
Nursing Enrollments 1978 Public Sector	5.9	5.2	8.4	.7	64.8	7.6	92.4
Nursing B.S. Degrees Awarded, 1978	3.4	3.8	7.1	.4	74.2	5.5	94.5
Nurses Licensed in Calif. 1975	2.8	.8	11.0	.2	86.5	1.9	98.1

Sources: Population figures from Department of Finance; composition of nursing work force from Functional Task Analysis Study, Department of Health; high school seniors from University of California Student Affirmative Action Plan.

Because there are significant gaps in these data, any conclusions must be drawn cautiously.

Black

Enrollment of Blacks in public four-year nursing programs declined between 1976 and 1978, both in numbers (down 24.9%) and in percentage of the total nursing enrollment (down from 7.5% to 5.9%). This decline occurred in virtually every public educational institution in California. Enrollment of Black men is only 2.7 percent of the Black enrollment in nursing, the lowest percentage of males in any ethnic group. The highest percentage of Blacks in nursing (13.6%) was at California State University, Los Angeles.

Hispanic

Enrollment of this minority group in nursing increased by 7.2 percent between 1976 and 1978, going from 4.6 percent of the total nursing enrollment to 5.2 percent. The enrollment of men seems to fluctuate, but stood at 9.8 percent of the Chicano nursing enrollment in 1978. The nursing school with the highest percentage of Chicano enrollment (8.6%) is at California State University, Los Angeles.

Asian

Enrollment of Asians, including Filipinos, in nursing remained fairly steady between 1976 and 1978, but the number of Filipinos has increased significantly while the number of other Asians has declined. Men accounted for only about 3.5 percent of the total Asian enrollment in nursing in 1978. The highest percentage of Asians enrolled in nursing (19.2%) is at San Francisco State University.

American Indian

Enrollment of American Indians in nursing programs remained low and trendless from 1976, constituting .7 percent of the total nursing enrollment at the beginning and end of that period. Although the numbers are too small to be statistically significant, it is interesting to note that males represented 13.0 percent of total enrollment of American Indians in nursing in 1978. No institution had more than 1.5 percent of its nursing enrollment made up of American Indians.

Women and Men

Men, of course, are the underrepresented sex in nursing. Male enrollment did not grow significantly between 1976 and 1978, although the percentage of men enrolled went from 6.8 percent to 7.6 percent, primarily because of a 6.3 percent decline in the number of women enrolled.

Sex and Ethnicity Data on Other Nursing Programs

Only fragmentary data on sex and ethnicity exist for nursing programs in the independent sector and for two-year nursing programs. Table NO-4 indicates the distribution by sex of B.S. degrees conferred in nursing in independent institutions of higher education in California.

TABLE NO-4

B.S. Degrees Conferred, By Sex, Independent Institutions

	1972		1973		1974		1975		1976		1977		1978	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Biola	0	22	N/A		0	28	0	29	0	39	1	43	N/A	
Loma Linda	0	66	N/A		2	72	2	81	1	76	1	80	3	81
Mt. St. Mary's	0	34	N/A		0	63	0	73	0	73	0	68	1	75
Pt. Loma	N/A		N/A		1	30	2	26	1	34	1	32	0	41
Univ. of S.F.	1	78	N/A		1	104	2	108	1	118	1	119	N/A	

Similar information on degrees conferred by sex exists for two of the four hospital diploma nursing programs; for one other hospital such data exists for enrollment but not degrees. Table NO-5 displays the information as furnished to the Commission by the hospitals.

TABLE NO-5

Diplomas Awarded and Enrollment by Sex, Hospital Nursing Programs

	1972		1973		1974		1975		1976		1977		1978	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
St. Luke's	N/A		N/A		0	36	0	44	0	41	2	39	N/A	
Merritt	N/A		1	63	2	69	1	82	2	77	3	70	N/A	
L.A. County Medical Center (enrollment rather than degrees conferred)	19	434	27	452	21	384	22	353	19	241	N/A		N/A	

The same institutions reporting in Table NO-5 also report ethnicity, but not in a way that permits matching that factor with sex. Overall totals by ethnicity are displayed in Table NO-6, using diplomas conferred by St. Luke's and Merritt, and enrollment for the Los Angeles County Medical Center.

TABLE NO-6

Diplomas Awarded and Enrollment, by Sex, Hospital Nursing Programs

	Black	Hispanic	American Indian	Asian	White	Other
St. Luke's						
Diplomas Awarded						
1974					33	1
1975		1		1	40	2
1976					41	
Merritt						
Diplomas Awarded						
1974	1	2			68	
1975	1				82	
1976	2	1		1	75	
L.A. County Medical Ctr.						
Enrollment						
1974	71	92	5	23	214	
1975	75	88		17	195	
1976	47	42		17	154	

It is very difficult to generalize from Tables NO-5 and NO-6 about the distribution by sex and ethnicity of enrollment and diplomas conferred. Generalizations about the ethnicity of students that seem appropriate to the two northern California hospitals are contradicted by the data from the one southern California hospital which reported.

Community College nursing programs can also be compared to some extent. No ethnicity data are available because of the limits of the HEGIS procedures, but the sex of graduates in certain two-year fields, including nursing, can be identified. Table NO-7 contains degrees conferred, by sex, for the last four years in California Community Colleges.

TABLE NO-7

Associate Degree Nursing Programs
Degrees Conferred, By Sex

School	1974-1975		1975-1976		1976-1977		1977-1978	
	M	F	M	F	M	F	M	F
American River	3	59			4	34	3	25
Antelope Valley	2	24	2	29	2	32	4	30
Bakersfield	7	41	4	44	1	27	5	32
Cabrillo	4	31	2	38	2	32	1	33
Cerritos	6	67	5	74	5	77	5	72
Chabot	0	51	0	0	2	51	1	49
Chaffey	5	52	4	30	2	68	3	65
C.C. of San Francisco	2	49	5	53	0	54	7	56
College of the Desert	5	51	6	52	11	48	18	72
College of Marin	3	27	3	48	2	42	2	40
College of the Redwoods	2	24	2	27	2	20	4	26
College of San Mateo	1	37	2	41	3	43	6	31
College of the Sequoias	3	22			2	28		
Compton College	1	41	2	45	2	46	0	37
Contra Costa	5	72	4	64	6	78	7	55
Cuesta	2	20	4	26	1	22	5	23
Cypress	4	93	5	104	11	105	7	100
De Anza	3	48	1	56	7	35	5	44
East Los Angeles	4	51	0	114	8	54	9	86
El Camino	7	53	5	66	3	80	4	72
Fresno City College	9	88	4	49	6	53	11	65
Golden West	4	69	5	115	11	2	8	105
Grossmont	5	43	6	40	6	43	3	47
Hartnell	0	30	1	21	3	23	0	0
Imperial Valley							6	24
Long Beach City College	9	115	10	153	6	153	8	116
L.A. City College	5	58	0	0	0	0	0	0
L.A. Harbor College	3	44	1	44	2	0	3	65
L.A. Pierce	5	60	4	48	5	49		
L.A. Southwest			1	52	2	59	8	56
L.A. Trade-Technical	0	115	6	48	4	71	15	142
L.A. Valley	6	124	23	130	13	115	14	178
Los Medanos							3	18
Merritt College	6	38	2	46	6	44	6	48
Modesto J.C.	5	32	2	47	11	83	2	42
Mt. San Antonio	1	42	0	38	2	44	2	54
Napa	9	42	6	38	2	30	5	38
Ohlone	2	35	2	27	4	33	3	33
Palomar	5	31	3	62	2	46	3	53
Pasadena City College	8	129	5	98	11	102	10	120
Rio Hondo	2	164	1	63	8	79	6	73
Riverside City College	8	66	9	60	2	81	8	83
Sacramento City College	7	48	2	38	5	58	3	48
Saddleback	3	58	3	56	2	51	3	57
San Bernardino Valley	3	51	3	56	4	58	4	62
San Diego City	3	27	4	26	4	25	4	27
San Joaquin Delta	3	52	10	59	3	43	2	58
San Jose C.C. - Evergreen Valley	5	50	5	43	4	59	4	39
Santa Ana	5	26	5	25	6	44	4	56
Santa Barbara C.C.	5	29	2	14	2	33	3	17
Santa Monica C.C.	2	59	3	54	4	58	1	58
Santa Rosa C.C.	8	40	0	0	0	0	0	0
Shasta	1	33	2	30	2	34	9	36
Solano	3	55	4	31	2	31	4	30
Southwestern	3	28	4	30	2	33	6	32
Ventura	3	35	4	51	3	47	2	69
Victor Valley					6	22	3	26
Totals	215	2829	196	2603	231	2682	272	2923

Source: Higher Education General Information Survey

During the period covered by these data, the percentage of men in Community College nursing programs has climbed from 7.1 percent to 8.5 percent. This figure is slightly higher than the percentage of men in public four-year nursing programs, and much higher than the percentage of those in private four-year nursing programs.

General Assessment

Chicanos are significantly underrepresented in public four-year nursing programs, Blacks are slightly underrepresented, and Asians and American Indians are overrepresented, compared to the general population. Whites also appear to be underrepresented, but prorating the "Other" and "No Response" answers back into the ethnic categories would probably eliminate this. It is unfortunate that data on ethnicity are not available for Community College nursing programs, which supply the bulk of the nurses trained in California.

Enrollment of men does not appear to be growing in four-year nursing programs, but is growing in two-year programs. In both cases, male enrollment represents a somewhat higher percentage than does the current ratio of men in the nursing work force. Male enrollment in private four-year programs remains quite low, and most diploma programs also report only a few men enrolled.

DENTISTRY

The distribution of students and graduates in dental education, by sex and ethnicity, is displayed in Tables DO-1 and DO-2. Because of incomplete reports from private institutions, gaps exist in the data in each table.

Similar data exist on enrollments in dental schools. Even though one year's enrollment data for one institution is missing, the totals for the first and last year of the three-year period are complete.

Table DO-3 displays comparisons between the sex and ethnicity displayed in Tables DO-1 and DO-2 and Other Populations. Because degree data for 1978 are incomplete, the comparisons for degrees will be for 1977, the last year for which data in that category is complete.

The data in the previous three tables, while incomplete, do show some basic relationships concerning the sex and ethnicity of students and graduates in dental education which are worth noting.

TABLE DO-1

Dentistry, Degrees Conferred, by Sex and Ethnicity

	Non-Resident Alien		Black Non-Hispanic		American Indian/ Alaskan Native		Asian/ Pacific Islander		Hispanic		White Non-Hispanic		Total		All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCLA															
1976	0	0	3	0	1	0	9	1	11	2	51	7	75	10	85
1977	2	2	3	1	3	1	4	2	3	0	49	24	64	30	94
1978	3	0	5	0	0	0	17	6	7	1	47	20	79	27	106
UCSF															
1976	1	0	5	0	0	0	11	4	5	0	61	2	83	6	89
1977	0	1	3	1	0	0	3	1	5	0	56	6	67	9	76
1978	0	0	7	1	1	0	12	2	11	0	49	5	80	8	88
UC TOTAL															
1976	1	0	8	0	1	0	20	5	16	2	112	9	158	16	174
1977	2	3	6	2	3	1	7	3	8	0	105	30	131	39	170
1978	3	0	12	1	1	0	29	8	18	1	96	25	159	35	194
LOMA LINDA															
1976	3	0	0	1	0	0	7	0	2	2	49	2	61	5	66
1977	6	0	0	0	0	0	5	1	1	0	50	3	62	4	66
1978	3	1	1	1	0	0	3	0	1	0	61	2	69	4	73
UOP															
1976	0	0	0	0	0	0	9	1	3	0	105	7	117	8	125
1977	3	1	1	0	0	0	15	2	1	0	103	11	123	14	137
1978	0	0	0	0	0	0	18	3	1	0	97	8	116	11	127
USC															
1976	3	3	7	1	0	0	22	1	11	0	97	2	140	7	147
1977	4	0	0	0	4	0	15	0	11	0	93	5	127	5	132
1978	5	1	5	0	0	0	22	3	7	6	75	10	114	20	134
TOTAL PRIVATE															
1976	9	3	7	2	0	0	38	2	16	2	251	11	318	20	338
1977	13	1	1	0	4	0	35	3	13	0	246	19	312	23	335
1978	8	2	6	1	0	0	43	6	9	6	233	20	299	35	334
GRAND TOTAL															
1976	10	3	15	2	1	0	58	7	32	4	363	20	476	36	512
1977	15	4	7	2	7	1	42	6	21	0	351	49	443	62	505
1978	11	2	18	2	1	0	72	14	27	7	329	45	458	70	528

TABLE DO-2

Dentistry, Fall Enrollment by Sex and Ethnicity

	Non-Resident Alien		Black Non-Hispanic		American Indian/ Alaskan Native		Asian/ Pacific Islander		Hispanic		White Non-Hispanic		Total		All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCLA															
1976	10	4	19	11	4	1	40	15	35	7	204	76	312	114	426
1977	10	2	23	18	1	0	55	20	54	6	208	81	351	127	478
1978	4	1	19	23	2	0	47	19	40	8	175	68	287	119	406
UCSF															
1976	1	1	18	9	2	0	53	6	49	2	209	27	332	45	377
1977	1	0	21	8	3	0	71	11	45	4	198	25	339	48	387
1978	1	0	14	10	3	0	82	12	45	5	196	33	341	60	401
UC TOTAL															
1976	11	5	37	20	6	1	93	21	84	9	413	103	644	159	803
1977	11	2	44	26	4	0	126	31	99	10	406	106	690	175	865
1978	5	1	33	33	5	0	129	31	95	13	371	101	628	179	807
LOMA LINDA															
1976	13	0	3	4	0	1	8	1	2	1	169	6	195	13	208
1977	12	3	2	2	0	0	18	4	3	0	181	8	216	17	233
1978	15	7	1	3	0	0	21	10	7	1	186	4	230	25	255
UOP															
1976	0	0	1	0	1	0	52	9	5	1	302	33	361	43	404
1977	0	0	0	0	0	0	56	9	5	1	307	30	368	40	408
1978	1	0	0	0	1	0	55	10	4	1	297	32	358	43	401
USC															
1976	37	6	15	3	4	0	52	6	45	9	327	26	480	50	530
1977	37	9	8	3	3	0	61	5	37	10	306	32	452	59	511
1978	15	4	6	2	5	0	95	13	39	9	300	33	460	61	521
PRIVATE TOTAL															
1976	50	6	19	7	5	1	112	16	52	11	798	65	1036	106	1142
1977	49	12	10	5	3	0	135	18	45	11	794	70	1036	116	1152
1978	31	11	7	5	6	0	171	33	50	11	783	69	1048	129	1177
GRAND TOTAL															
1976	61	11	56	27	11	2	205	37	136	20	1211	168	1651	263	1914
1977	60	14	54	31	7	0	261	49	144	21	1200	176	1726	291	2017
1978	36	12	40	38	11	0	300	64	145	24	1154	170	1676	308	1984

TABLE DO-3

Comparison of Students and Graduates in Dentistry to Other Populations

	Black	Hispanic	Asian	American Indian	White	Male	Female
Total California Population 1976	7.7%	15.8%	3.7%	.5%	71.5%	49.8%	50.2%
B.S. Degrees Awarded 1977	4.6	4.9	6.9	.8	79.9	55.3	44.7
Dentistry Enrollment 1978							
UC	8.2	13.4	19.8	.6	58.5	77.8	22.2
Private	1.0	5.2	17.3	.5	72.4	89.0	11.0
Total	3.9	8.6	18.3	.6	66.7	84.5	15.5
Dentistry Degrees Conferred 1977							
UC	4.7	4.7	5.9	2.4	79.4	77.1	22.9
Private	.3	3.9	11.3	1.2	79.1	93.1	6.9
Total	1.8	4.2	9.5	1.6	79.2	87.7	12.3
Dentists in California*	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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*A 1976 survey by the American Dental Association reported that nationally Blacks constituted 1.8 percent of the dental profession, and Women 1.0 percent. Data were not available for other groups.

SOURCE: Population figures from Department of Finance.

Black

While Blacks are well represented numerically in dental school enrollments in the University of California, and poorly represented in independent dental schools, their share of degrees conferred is substantially less in both sectors. Since there are more independent institutions with dental programs, the net proportion of Blacks in dental education is fairly low. Women now represent half of the Black dental enrollment at the University of California, and a significant portion in the independent sector. In both sectors, however, this proportion has not yet been reflected in degrees conferred.

Hispanic

Dentistry is one of only two health sciences fields in which Chicanos are represented more fully than Blacks. In the University of California, the percentage of Chicano dental enrollment approaches the percentage of Chicanos in the general population. Women make up 14.5 percent of the dental enrollment of this group, not so large a proportion as that of Black women.

Asian

Asians are extremely well represented numerically both in enrollment and degrees conferred in dentistry, and in both the public and independent institutions. Women students, however, do not represent a sizable portion of Asian enrollment.

American Indian

Because of the small numbers of students involved in dentistry, any generalizations about American Indians must be restricted to the particular time and place of the data, and cannot be used to suggest any sort of established relationship or trend. American Indians seem to have graduated in 1977 in greater numbers than their proportion of the general population (.5%) would suggest, but their 1978 enrollment reflects a percentage comparable to that of the general population which is American Indian.

Women

The University of California enrolled women in dentistry in 1978 at twice the rate of independent institutions, and in 1977 graduated more than three times as many women. Nevertheless, even in the University of California, women in general are underrepresented in dentistry by any measure, although as noted earlier, Black women are represented adequately in terms of numbers.

General Assessment

Dentistry is a field in which minorities and women in the University of California have been enrolled at reasonably high levels, but this enrollment has been offset by considerably lower enrollments in independent institutions. 2/ The University enrollments augur for a higher number of minority and women graduates in the near future. Because data are not presently available on the composition of California's dental work force, by sex and ethnicity, it is impossible to infer what impact the present enrollment mix will have on the profession of dentistry.

2/ An interesting area for future study is the possible effect of tuition in independent institutions on enrollment of women and minorities in the health professions.

PHARMACY

The distribution of students and graduates in pharmacy, by sex and ethnicity, is displayed in Tables PO-1 and PO-2.

Similar data are available concerning enrollments in pharmacy, but the data are not so complete for students as for graduates.

Comparisons between the data in Tables PO-1 and PO-2 and other key populations are contained in Table PO-3. Because of the incompleteness of enrollment data for 1978, enrollment comparisons are for 1977, the only year with complete data in that category.

The data in the previous three tables, although incomplete, do show interesting relationships concerning the sex and ethnicity of students and graduates in pharmaceutical education.

Black

Blacks are well represented proportionately in the University of California pharmacy enrollment, but considerably less so in the three independent institutions with pharmacy programs. Women outnumber men among Blacks enrolled in pharmacy, although women do not yet receive as many degrees as do men.

Hispanic

Enrollment of Chicanos in pharmacy is rather light in both the public and independent sectors, although the number of degrees awarded to Chicanos has more than tripled during the period 1976-1978. Enrollment of women is not large, except at the University of the Pacific where fragmentary data show that more than half of the Chicanos enrolled in pharmacy are women.

Asian

Asians have obviously identified pharmacy as a particularly desirable field. In the University of California over 40 percent of the degrees awarded in pharmacy in 1978 went to Asians, compared to the slightly more than 45 percent which went to whites. Women outnumber men in Asian pharmacy enrollment at the University, although men still lead in degrees conferred. In the independent schools, the percentage of Asian enrollment is even higher than in the University, although there are considerably fewer women enrolled. Also, in the independent institutions, the percentage of degrees conferred to Asians is roughly the same as the percentage of their enrollment. At the University, Asians

TABLE PO-1

Degrees Conferred, Pharmacy, by Sex and Ethnicity

	Non-Resident Alien		Black Non-Hispanic		American Indian/Alaskan Native		Asian/Pacific Islander		Hispanic		White Non-Hispanic		Total		All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCSF															
1976	0	0	0	0	0	0	8	19	2	0	29	3	39	22	61
1977	1	1	0	3	0	0	17	16	3	0	29	21	50	41	91
1978	0	3	2	3	0	0	21	15	4	0	25	15	52	36	88
USC															
1976	5	2	0	2	1	0	25	16	1	0	56	18	88	38	126
1977	7	1	1	4	0	0	20	13	5	1	65	25	98	44	142
1978	8	1	1	1	3	0	23	15	3	0	66	20	104	37	141
UOP (Pharm.D.)															
1976	0	0	1	0	0	0	28	13	1	0	90	32	120	45	165
1977	0	0	1	0	0	0	42	7	0	0	67	20	110	27	137
1978	0	0	1	0	0	0	28	8	4	0	63	29	96	37	133
UOP (B.S.)															
1976	0	0	0	1	0	0	3	5	1	0	26	9	30	15	45
1977	0	0	0	1	0	0	7	2	1	0	32	18	40	21	61
1978	2	1	2	0	0	0	5	4	2	2	17	12	28	18	46

TABLE PO-2

Fall Enrollment, Pharmacy, by Sex and Ethnicity

	Non-Resident Alien		Black Non-Hispanic		American Indian/Alaskan Native		Asian/Pacific Islander		Hispanic		White Non-Hispanic		Total		All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCSF															
1976	4	4	11	18	0	0	54	60	24	5	122	98	215	185	400
1977	4	6	13	20	0	0	56	58	22	5	134	109	229	198	427
1978	6	4	17	17	0	0	52	63	21	5	132	126	228	215	443
USC															
1976	19	6	10	10	5	0	99	69	22	6	245	116	400	207	607
1977	11	7	5	10	4	2	117	68	34	6	225	115	396	208	604
1978	5	5	4	8	1	2	123	79	20	11	216	135	369	240	609
UOP (Pharm.D.)															
1976	31	15	1	1	0	1	96	23	16	4	187	81	331	125	456
1977	19	12	1	1	2	0	95	39	8	5	166	92	291	149	440
1978	21	8	0	4	3	1	75	48	6	7	143	88	248	156	404
UOP (B.S.)															
1976	4	3	2	1	0	1	16	19	5	3	71	42	98	69	167
1977	9	4	2	0	0	0	14	19	6	3	59	35	90	61	151
1978	5	6	1	0	0	0	20	19	6	2	62	36	94	63	157

TABLE PO-3

Comparison of Students and Graduates in Pharmacy to Other Populations

	Ethnic Group					Sex	
	Black	Hispanic	Asian	American Indian	White	Male	Female
Total California Population 1976	7.7%	15.8%	3.7%	.5%	71.5%	49.8%	50.2%
B.S. Degrees Awarded, California 1977	4.6	4.9	6.9	.8	79.9	55.3	44.7
Pharmacy Enrollment 1977							
UC	7.8	6.3	26.7		56.9	53.6	46.4
Private	1.6	5.2	29.5	.7	57.9	65.0	35.0
Total	3.2	5.5	28.7	.5	57.6	62.0	38.0
Pharmacy Degrees Conferred 1978							
UC	5.7	4.6	40.9		45.5	59.1	40.9
Private	1.6	4.1	26.3	.9	64.3	71.2	28.8
Total	2.4	4.2	29.5	.7	60.2	68.5	31.5
Pharmacists in California, 1973 Survey	4.2	1.7	12.7	N/A	82.0	88.0	12.0

SOURCES: Population figures from the Department of Finance; pharmacist data from the John Wong Report.

represented 26.0 percent of the enrollment in pharmacy, but received 40.9 percent of the degrees conferred in 1978.

American Indian

American Indians are reasonably represented in both enrollment and degrees conferred in pharmacy. The University of California has no American Indians enrolled in pharmacy, but the University of Southern California has enough to offset that absence. No information is available concerning the number of pharmacists in California who are American Indians.

Women

Women are extremely well represented numerically in pharmacy enrollment in the University of California (48.5%), and account for more than 40 percent of the degrees conferred. While women are not so well represented in independent institutions, they account for about one-third of the pharmacy students and graduates.

General Assessment

Pharmacy appears to be a field in which Asians and women have taken special advantage of educational opportunities, to the point where white males—usually the dominant group in health science fields—are in a minority of graduates (46.4% in 1978) and enrollment (35.4% in 1977). Whites, overall, occupy fewer than six out of ten seats in pharmacy schools. Blacks are reasonably well represented, but Chicano enrollment remains light.

OPTOMETRY

The distribution of students and graduates in optometry, by sex and ethnicity, is displayed in Tables OO-1 and OO-2.

The demographic data in Tables OO-1 and OO-2 are compared to data for Other Populations in Table OO-3.

From the three tables, the following inferences may be drawn about the participation of ethnic minorities and women in optometric education.

Black

Blacks are consistently underrepresented in optometric education. Although there were more Black graduates in 1978 than in the two previous years, Black enrollment dropped. The University of California enrolls a higher percentage of Blacks than does the one private institution, although numbers are very small in both.

Hispanic

Optometry, like dentistry, is a field in which Chicanos are represented more fully than Blacks. Nevertheless, Chicanos are generally underrepresented, except when compared to the eligibility pool of recent B.S. graduates. In the University of California, a reasonable percentage of Chicanas are enrolled in optometry, but the percentage is quite low in the independent institutions.

Asian

Optometry, like the other health science fields, is particularly attractive to Asians, who constitute more than one-quarter of the optometric enrollment in the University of California. Asian enrollment in the independent sector is proportionately much smaller. In both sectors, women represent a sizable share of the Asians in total degrees conferred (45%) and enrollment (34.4%).

TABLE OO-1

Degrees Conferred, Optometry, by Sex and Ethnicity

	Non-Resident Alien		Black Non-Hispanic		American Indian/ Alaskan Native		Asian/ Pacific Islander		Hispanic		White Non-Hispanic		Total		All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCB															
1976	3	1	2	0	0	0	15	6	1	0	26	6	47	13	60
1977	1	1	2	0	0	0	7	10	1	0	27	8	38	19	57
1978	1	0	1	2	0	0	7	9	1	3	31	6	41	20	61
SCCO															
1976	0	0	0	0	0	0	8	1	2	0	49	3	59	4	63
1977	0	0	0	0	0	0	6	1	4	0	67	6	77	7	84
1978	1	0	1	0	1	0	4	0	2	0	47	6	56	6	62
TOTAL															
1976	3	1	2	0	0	0	23	7	3	0	75	9	106	17	123
1977	1	1	2	0	0	0	13	11	5	0	94	14	115	26	141
1978	2	0	2	2	1	0	11	9	3	3	78	12	97	26	123

TABLE OO-2

Fall Enrollment, Optometry, by Sex and Ethnicity

	Non-Resident Alien		Black Non-Hispanic		American Indian/ Alaskan Native		Asian/ Pacific Islander		Hispanic		White Non-Hispanic		Total		All
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
UCB															
1976	2	1	6	4	0	0	38	29	9	4	129	31	184	69	253
1977	3	0	5	5	0	0	33	27	12	4	139	27	192	63	255
1978	0	2	3	3	0	0	37	21	11	2	147	31	198	59	257
SCCO															
1976	0	0	1	1	1	0	32	5	11	0	313	26	358	32	390
1977	0	0	1	1	2	0	28	6	10	0	309	40	350	47	397
1978	1	0	2	0	2	0	22	11	12	1	286	50	325	62	387
TOTAL															
1976	2	1	7	5	1	0	70	34	20	4	442	57	542	101	643
1977	3	0	6	6	2	0	61	33	22	4	448	67	542	110	652
1978	1	2	5	3	2	0	59	32	23	3	433	81	523	121	644

TABLE 00-3

Comparison of Students and Graduates in Optometry, by Sex and Ethnicity, to Other Populations

	Ethnic Group					Sex	
	Black	Hispanic	Asian	American Indian	White	Male	Female
Total California Population 1976	7.7%	15.8%	3.7%	.5%	71.5%	49.8%	50.2%
B.S. Degrees Awarded, California 1977	4.6	4.9	6.9	.8	79.9	55.3	44.7
Optometry Enrollment 1978							
UC	2.3	6.2	24.0		66.7	77.5	22.5
Private	.5	3.4	8.6	.5	86.8	84.0	16.0
Total	1.9	4.1	12.4	.4	81.8	82.2	17.8
Optometry Degrees Conferred 1978							
UC	4.9	6.6	26.2		60.7	67.2	32.8
Private	1.6	3.3	6.4	1.6	85.5	90.3	9.7
Total	3.3	4.9	16.3	.8	73.2	78.9	21.1
Optometrists in California, 1973	.3	.5	7.3	<.1	90.4	97.2	2.8

SOURCES: Population figures from the Department of Finance; optometrist data from 1973 Report of Optometric Manpower Resources project.

American Indian

American Indians have not been enrolled in or graduated from the optometry program of the University of California during the years 1976-1978. However, there has been a small number at California's one independent optometry school—enough to suggest that American Indians are adequately represented in this field.

Women

Optometry remains a predominantly male field, but at the University of California almost one-third of the graduates and almost one-quarter of the enrollment in 1978 was made up of women. In the one independent institution the proportions are much smaller. With small total numbers in optometric practice, this output of female graduates should soon be reflected in the composition of the professional work force.

General Assessment

The progress that has been made in increasing the enrollment of women in optometric education, particularly in the University of California, seems to have been matched for Blacks and Chicanos. Data available on the ethnic composition of the profession shows that optometry has been dominated by white males, although Asians are also well represented.

PROGRAMS TO IMPROVE EDUCATIONAL OPPORTUNITY IN THE HEALTH SCIENCES

There are a number of programs which are seeking to improve opportunities for minorities and women to pursue careers in the health sciences. Some of these programs are targeted specifically toward professional education in the health sciences. Others operate at the more fundamental level of assuring that minorities and women are adequately prepared and motivated in high school--or earlier--to attend college, and to undertake an appropriate academic major. The Postsecondary Education Commission has reported on the general situation in affirmative action in California higher education in a series of reports on Equal Educational Opportunity; consequently, this Plan will not attempt to identify all of the programs through which women or minorities may receive assistance en route to a career in the health sciences. This Plan does, however, attempt to identify those programs at each level which are designed to expand enrollment of women and minorities in the health sciences.

Programs to Interest Students in and Make Them Eligible for College

In 1977, the University of California created a Task Force on Affirmative Action in Graduate and Professional Enrollment. The report of that Task Force concluded that there are many factors that must be examined in attempting to increase minority enrollment, other than simply how admissions criteria are developed and how affirmative action programs identify suitable applicants.

> Perhaps the most significant fact is that participation of minorities in graduate/professional school is shaped by their participation throughout the educational system. Without question, a successful effort to increase minority access in graduate and professional schools requires an appropriate pool of minorities with requisite qualifications at the undergraduate level. In turn, minority access to undergraduate school begins with elementary, junior high and high school and the types and pattern of courses taken. Examining the educational attainment patterns of minorities, it becomes clear that

> a major impediment to the establishment of an adequate pool of minorities with undergraduate degrees qualified to proceed to graduate and professional schools is their lower participation rates at other levels of the educational system.

The report went on to identify a number of outreach programs which the University was using or planned to use in reaching minority students in the public schools, particularly in grades seven through twelve. Under this approach the University identifies schools with large minority enrollment, insures that the administrators of those schools receive accurate data on the performance of their graduates at the University, and identifies the number of students in the schools who are potentially eligible for admission to the University. After developing plans with each school administration, the University enters into the "Partnership Program," through which information on higher education is furnished to minority students and parents. The number of participating schools is increased each year, as resources permit. The goals of the program are to provide information on preparation for a college education to all low-income and minority students, and to provide whatever special assistance such potential students may need.

A second component of the University's outreach program is built around early high school education. Students who have been identified and assisted in the early phases of the "Partnership Program" are now assisted as they move through secondary education. Tutoring programs and special programs, such as Upward Bound and summer academic institutes, attempt to provide academically enriching experiences. Other programs work to make high school teachers more aware of the special learning needs of such students. (An example of this type of program is the California Writing Project.)

Two other outreach programs also exist. One statewide program operates in elementary education. This program is the Community Teaching Fellowship Program, through which graduate students teach mathematics to disadvantaged students in twelve elementary schools around the State. The other is the Expanded Food and Nutrition Program, through which nutrition assistants of the Cooperative Extension Service are being trained to talk with families about postsecondary education during their nutrition counseling, and to leave relevant materials with each family.

In addition to these campus-based programs there is a significant community-based program designed to attract minority students into science and technical fields by providing a variety of experiences within local scientific and technical establishments. This program, called MESA (Mathematics, Engineering, and Science Achievement), has been funded primarily by foundations and private industry, but State funds are now going to MESA for the first time.

All of these programs are described in more detail in the University of California Student Affirmative Action Plan, published in May 1978.

Programs Used by Professional Schools to Recruit and Retain Minority Students

University of California

In 1979, the University of California established another task force on increasing minority enrollment in graduate and professional schools. The draft of this task force's report identified, campus by campus, the special efforts which are being made by professional schools to recruit more women and minorities. While these efforts vary somewhat from campus to campus, there are a number of practices which seem to be utilized frequently. These include:

- Using the Minority Graduate Student Locator of the Educational Testing Service to identify talented minority students to whom brochures and materials should be sent.
- Listing the institution's programs in the publication, Graduate and Professional School Opportunities for Minorities.
- Conducting Partnership Programs of early outreach, with high school and junior high visitations, summer medical-experiences programs, and seminars on health careers with role-model speakers.
- Conducting minority career days in the health professions.
- Corresponding with professional colleagues in institutions with minority enrollments.
- Exchanging information and names among the Coordinating Committee on Graduate and Professional Advancement (made up of the University's nine campuses), as a recruitment consortium.
- Faculty visits to college and university campuses.

There are also a number of programs which assist minority and women students once they have arrived on campus. These support services include:

- Various forms of financial assistance;
- Summer orientation;
- Counseling;

- Special curriculum options;
- Tutorial Assistance;
- Preparation for National Board Examinations in the health sciences;
- Development of study and examination skills;
- Self-instruction materials;
- Loan funds;
- Housing; and
- Ethnic or women's organizations (e.g., "Chicanos for Creative Medicine" at the University of California, Los Angeles).

Independent Institutions

Special efforts have also been made by independent institutions to recruit additional minority students in the health sciences. Those of the University of Southern California are typical. At that institution, the School of Medicine through a grant of $637,936 from the Robert Wood Johnson Foundation, has become the lead agency in a consortium of six undergraduate institutions providing educational enrichment, counseling, and tutorials for disadvantaged premedical students. Special loan funds assist minority students in medicine and dentistry, and the Office of Minority Affairs identifies and recruits qualified minority pre-medical students throughout the United States. The staff of this Office offers comprehensive counseling services to incoming minority students to facilitate transition to the medical school environment.

Federal Equal Opportunity Programs in the Health Sciences

The federal government has been active in encouraging additional enrollment of minorities in health sciences education. The principal federal effort in recruiting and retaining additional minority health professionals is the Health Career Opportunity Program of the Office of Health Resources Opportunity. This program is currently funding seventeen projects in California at a total cost of $1,527,596, as follows:

1.	UCSF School of Pharmacy	$ 49,999
2.	UCLA School of Dentistry	99,999
3.	Native American Scholarship Fund, Palo Alto	40,000
4.	UCSF School of Medicine	90,000
5.	UCSF School of Dentistry	134,913
6.	USC School of Medicine	70,000
7.	UCI School of Medicine	145,000
8.	Canada College	85,000
9.	UCSF School of Medicine	90,000
10.	California Rural Indian Health Board, Carmichael	80,000
11.	La Raza Medical Association, Berkeley	95,000
12.	East Bay Health Foundation, Oakland	90,000
13.	East Los Angeles Health Task Force, Los Angeles	90,000
14.	California College of Podiatric Medicine, San Francisco	70,000
15.	Delta Sigma Theta, Inc., San Francisco	40,000
16.	Federacion Rural de Salud de California, San Francisco	182,587
17.	Native Americans to Public Health, Berkeley	75,069

These projects range in scope from community-based, health-career orientation for young people (#12 and #13 above) to scholarships (#3) to upgrading undergraduate students' potential for entering professional school (#8).

Another significant federal program is the Minority Biomedical Support (MBS) Program which encourages minority students to become involved in laboratory research in the biological sciences. About $600,000 in federal support is currently going to four MBS programs in California: California State University, Los Angeles; Charles R. Drew Postgraduate Medical School; and the University of California, San Diego and Santa Cruz.

A new federal program, authorized by PL 95-561, provides funding for pilot projects in outreach. This program authorizes grants to colleges to conduct programs of educational enrichment directed at disadvantaged high school students with the aim of informing, motivating, and preparing them to pursue professional health careers. The program anticipates following students through five years of their education, beginning with the ninth grade, a longitudinal dimension which is missing from most grant programs in health manpower.

No explanation of federal activity in the field of equal educational opportunity in the health sciences would be complete without some reference to the Bakke decision by the U.S. Supreme Court. The decision held that admissions practices designed to increase minority enrollment could not utilize quotas of seats specifically set aside for minorities, but that race—like disadvantage—could be a factor in admissions practices in the name of greater diversity or ethnic balance in student bodies. This decision has caused admissions procedures in some professional schools to be modified. Because all of the students reported in the data in this Plan were admitted to professional schools before the Bakke decision, it is impossible to identify its effects in these enrollment data.

RECOMMENDATIONS

There are programs at some institutions in which some minorities and women are enrolled in reasonable numbers. However, it is clear that Blacks, Chicanos, and women have not participated in health sciences education in numbers in any degree commensurate with their proportion of the general population of California. The Postsecondary Education Commission, from its inception, has endorsed the goal that the overall composition of student populations in California's institutions of higher education should approximate the sex and ethnic diversity of the State's population. The Commission believes it is equally important that major specialized programs of higher education, such as health sciences education, also attain a comparable distribution of students by sex and ethnicity.

The data in this chapter indicate that California is still far from achieving this goal. The recommendations which follow take into account the seriousness of the underrepresentation of these groups, as well as the existence of practical limitations--such as a fixed number of places in professional schools--which may require reordering State priorities to achieve a more representative student population and professional work force in the health sciences.

Recommendation One

California institutions should continue outreach, recruiting, and admissions programs to increase the number of minority and women undergraduates as a means of increasing the numbers eligible for programs in the health sciences.

Recommendation Two

Monitoring of educational opportunities in the health professions should be a part of any ongoing monitoring of affirmative action activities by segmental headquarters and such agencies as the California Postsecondary Education Commission. As a part of such monitoring, those special State and federal programs presently operating to increase enrollment of ethnic minorities and women in the health sciences should be evaluated by January 1, 1981, to determine their effectiveness.

Recommendation Three

California institutions should continue to recruit and admit additional, qualified ethnic minorities and women in the health sciences to offset the historic underrepresentation of these groups. Women, as a group, are underrepresented in proportion to their numbers as college graduates, as well as their numbers in the total population. They should be given special priority in these recruiting and admission efforts.

Recommendation Four

All entities of State government which support, govern, or administer education, from the Legislature to local campuses and public school systems, should increase their efforts to identify and overcome those barriers which have prevented minorities and women from participating fully in professional education in the health sciences. Such efforts should be assigned high priority in the allocation of public resources of time and money.

CHAPTER VII

HEALTH SCIENCES EDUCATION: SOME CONCLUDING PERSPECTIVES

In concluding this first biennial Health Sciences Education Plan, the Commission can report to the people of the State that the educational programs and facilities in California which prepare physicians, nurses, dentists, pharmacists, and optometrists are sufficient to meet the current demand for such health professionals.

Manpower problems remain in several fields, however: in medicine, in the distribution of physicians by location and specialty; in nursing, in the excessive attrition of trained manpower; in dentistry, in the existence of considerable unmet need in the face of well-met demand; in all fields, in the lack of women and certain ethnic minorities in the professional work force. Admittedly, most of these issues are primarily the concern and responsibility of health manpower planners. At the same time, these problems affect and are affected by both the form and content of health sciences education. Therefore, the recommendations offered by the Commission in this Plan call for health science educators and planners to participate in the resolution of these manpower issues.

The Commission is now aware of both the complexity and difficulty of health sciences education planning, particularly in a state as large and diverse as California. Such planning is still in the developmental stage, and many procedural and substantive aspects of such planning will require attention in future plans in this series. Conspicuous among the unresolved issues are the following:

- Significant gaps still exist in the data available on health sciences education, even though considerable progress has been made in closing these gaps during the development of this Plan. With the passing of time, additional years of data will provide a sounder foundation for establishing trends. Nevertheless, additional kinds of data are still needed. Particularly needed are additional data on nursing education in Community Colleges, independent institutions, and hospitals; current sex and ethnicity data for the work force in all health fields; means of tracking students such as residents through their training into their professional practice; success ratios in licensing examinations by sex and ethnicity and by type of training program; and better measures of total health care--or, ideally, of health itself--by geographical area. Some of this information can best be obtained by educators, some by health manpower agencies such as the Office of Statewide Health Planning and Development. A bill has recently been introduced in the Legislature to require better data collection within the various health professions.

- Planning and coordination is made more difficult by the existence of a number of agencies with similar responsibilities in the health manpower field: educational agencies, health departments, licensure boards, professional associations, accrediting bodies, foundations, consumer groups, governmental agencies, etc. Educational plans exist at institutional, segmental, and now statewide levels. Manpower plans with educational implications exist at community, regional (Health Systems Agency), State, and federal levels; manpower plans and studies also exist within separate health professions as well. While this overlap may lead to a fuller identification of the issues of health sciences education and to more complete data, it is difficult for any organization to emerge from this jumble of agencies as the authoritative or credible planning agency with the leadership necessary to be an agent of change.

- It is difficult to know, philosophically as well as pragmatically, how to utilize the mid-level practitioner. Under the general assumptions cited in the introduction to this Plan--that health care to be cost effective should generally be delivered by the lowest level of professional who can competently provide it, and that in general health professionals should function within the upper reaches of their capabilities rather than the lower--it makes good sense to call, as this Plan has, for greater utilization of mid-level practitioners to deliver certain kinds of health care. There is a danger, however, that a two-level system of health care may develop, with mid-level practitioners providing care to the poor while the senior professionals of each field provide care to the affluent. However, it should be noted that mid-level practitioners have been widely and effectively utilized in Health Maintenance Organizations whose members come from a broad spectrum of society, including the affluent; a good example is the Kaiser Foundation.

  Practical problems also exist in calling for the utilization of mid-level practitioners in certain fields in which the senior professionals perceive the possibility of an oversupply of practitioners or a lack of sufficient patients.

- Ideally, manpower or educational planning for one health profession should consider the potential contribution of other health professions. In practice, however, because of the way the professions are organized and licensed, planners generally treat health fields as discrete territorial monopolies. Similarly, they do not identify the health care needs of a given community and then determine what type or combination of health professionals can meet those needs most effectively. Instead, planners are dependent on traditional views of who does what, and on knowing what the professional-to-population ratios are for a series of health professions in the community, with the assumption that certain low ratios suggest the need for certain kinds of professionals. Because of this traditional view of the role of various health professions, it is difficult to plan for the education of professionals as members of a total health care team in a community; it is much simpler to treat them individually as pharmacists, optometrists, dentists, nurses, or physicians.

- Planning in the health sciences has certain inherent limitations. One is the autonomy of certain health professions. Medicine, in particular, has a private establishment made up of associations and accrediting/certifying bodies which exercises enormous influence over the practice of medicine, and on the educational programs which train physicians. Other limitations on planning exist in the form of external influences not subject to governmental control. For example, the medical malpractice insurance situation in California has influenced the practice of medicine, with many family physicians narrowing the scope of their practice to avoid extremely high insurance rates. In other instances the actions of the federal government may operate at cross purposes with the work of planners at the state level. A good example is the federal system of third-party payments for medical care. Such payments are higher for specialized medical care in hospital settings than for family medicine in outpatient settings. Thus, the state planner has difficulty in inducing physicians and residents to be family physicians in the face of financial incentives to the contrary. A third serious complication in health sciences planning in California is the large number of professionals who have been trained in other states, and the continued influx of such people into the State in locations and types of practice of their choice. In one sense this influx is a fiscal bargain for California, inasmuch as the State has acquired highly skilled health professionals without the costs associated with training such people; this benefit to the State, however, may be offset if the newcomers choose to practice in locations and specialties already amply served, making it even more difficult for the planner to mitigate the maldistribution problem.

- The educational planner, like the health manpower planner, would prefer to plan toward the maintenance of wellness, rather than the treatment of sickness, as the goal of the health professions. Nevertheless, the system is still geared to sickness. If the goal of health sciences education is to train professionals who will care for the health of society, albeit from a remedial rather than a preventive perspective, perhaps the postsecondary education establishment also has the responsibility to train individuals to take responsibility for their own health. We are ultimately responsible for our own health--in that we are generally free to choose between healthful and unhealthful behavior--but society has the responsibility of educating its citizens to make intelligent choices in the area of personal health. (It may also have to assume the burden of caring for those citizens whose health has been impaired by unwise choices, as much a problem today as it was in the New Testament parable of the Prodigal Son.)

It is clear that much preventive health care can and should be carried out by laypersons, particularly with respect to nutrition, hygiene, exercise, use of tobacco and alcohol and drugs, accident prevention, etc. Secondary and postsecondary education institutions have traditionally tried to provide knowledge and incentives which would enable individuals to assume responsibility for these matters; unfortunately, courses in health, hygiene, physical education, healthful living, etc., have frequently been regarded--and rightfully so--by both students and teachers as banal and useless. Thankless as the task may be, educators will have to find more effective ways of orienting students to good health habits.

In the field of preventive health care society must assume responsibility for those problems which can best be addressed collectively rather than individually. In addition to providing direct health care to some people and education to all, government is concerned with insuring air and water quality, providing protection from toxic substances, insuring safe working conditions, promoting safe use of foods and drugs, etc. Some of the results of this activity becomes controversial, in findings of fact as well as judgment: the Food and Drug Administration's position on saccharin, opposition of various state governments to laetrile, requirements for automotive seat belts and motorcycle helmets, etc. Obviously, postsecondary institutions educate the professionals who work in public health, but both secondary and postsecondary education must also equip the individual consumer to sort through the conflicting claims of fact and the issues of personal freedom versus governmental responsibility.

Significantly, many of the issues of health maintenance in our society are philosophical issues, a circumstance which suggests the need for broad educational preparation which will enable both the professional and the patient to respond wisely at that level. Perhaps a greater challenge to the postsecondary education establishment than improving health sciences education lies in doing a better job of education for health of all Californians.

In concluding this first biennial Health Sciences Education Plan, the Postsecondary Education Commission reaffirms its confidence in the institutions of higher education, public and private, within the State of California as responsible and effective primary resources in health sciences education. Where imbalances exist in the number and type of person being trained, in the demand for educational opportunity compared to the need for health professionals, and in the nature and location of professional practice chosen by graduates, the Commission believes that consultation among all concerned parties can open the way to the planning and coordination necessary to correct these imbalances.

Because of its strong involvement in health care and the associated costs of that care, State government has perhaps a stronger claim to broad purview over health sciences education than to most other forms of education. The Postsecondary Education Commission, as an agency with roots both in government and in the academic world, is confident that the consultation and cooperation advocated in this Plan can facilitate the joint efforts of government and the academic community which are needed to strengthen health sciences education in California. Such efforts will also promote the diversity and competency of health professionals, better health care for the people of the State, and broader opportunities for all people in California to pursue rewarding careers in the health sciences.

Even as it concludes this first Health Sciences Education Plan, the Postsecondary Education Commission is beginning development of the second Plan. The Commission anticipates working closely again with the Office of Statewide Health Planning and Development, and taking into account the second Health Manpower Plan produced by that agency. The Commission also anticipates examining its own response to health sciences education planning. including the role of goals and objectives in such planning.